MORE BANG FOR YOUR BUCKS
- A cheat sheet on ROI metrics. PAGE 40
- Two perspectives on reducing hassles with vendors. PAGES 30 AND 33

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MAY 13, 2002 ▪ VOL. 36 ▪ NO. 20 ▪ $5 COPY

IBM DROPS INTEL HIGH-END SERVER

Move forces users to seek other platforms

BY JAIKUMAR VIJAYAN

Users of an IBM server line the company acquired through its purchase of Sequent Computer Systems Inc. are being forced to migrate to other systems as a result of IBM's decision to ditch the technology.

IBM announced the Intel-based 64-processor xSeries 430 server featuring Sequent's Non-Uniform Memory Architecture in March 2001. In March of this year, it posted a notice of plans to withdraw the product, along with Sequent's associated Dynix/ptx Unix operating system.

IBM Server, page 16

Lost Features

IBM will stop selling the xSeries 430 at the end of this year. Its high-end features include the following:

- Based on Non-Uniform Memory Architecture
- Support for up to 64 Intel Pentium III Xeon processors
- Up to 64GB of memory
- Up to 582TB of common storage
- Partitioned I/O
- Clustering to 16 nodes

MERGED HP DELIVERS PROMISED PLAN

Users' top demand met with detailed road map

BY JAIKUMAR VIJAYAN

The new Hewlett-Packard Co. didn't keep users in suspense.

The company formally announced its road map and organization last week with a flurry of details on product and service strategies, customer support, sales force integration and management structure.

At the May 7 launch event in Cupertino, Calif., HP Chairwoman and CEO Carly Fiorina and President Michael Capellas said much of the integration plans had already been completed and put in motion. "We are ready," Fiorina said. "We are executing on our decisions, as opposed to making them."

Users and analysts were mostly impressed, and soothed, by the flood of early information after HP completed its acquisition of Compaq Computer Corp. on May 3.

"There seems to be no reason for concern," said Carl Ludwig, senior vice president of research at Blue Sky Studios Inc. in White Plains, N.Y. The animation studio uses more than

Road Map, page 73

TECH BLUEPRINT
For details on the new HP product line, see the chart on **PAGE 73.**

NEWSPAPER

WEBSPHERE USERS STANDOFFISH ON 5.0

IBM urges taking leap for more functionality; users trust earlier versions for critical apps

BY CAROL SLIWA
SAN FRANCISCO

In the midst of a heated market-share battle with rival BEA Systems Inc., IBM last week announced the 5.0 version of its WebSphere Application Server, touting enhanced support for the latest Web services and J2EE standards.

WEB SERVICES

But several users were nonplused by the news made at IBM's DeveloperWorks Live conference, since they haven't even moved to WebSphere Version 4 yet.

"We end up being behind the release curve chronically," said Robert Metz, an IT architect at Benton Harbor, Mich.-based Whirlpool Corp. Metz said his firm now does major development on WebSphere 3.5, but Whirlpool still has some live applications running on WebSphere 2.

Metz said the time and effort required to make a move have kept his company from making the jump to Version 4.

And Whirlpool is hardly alone. WebSphere 3.5 is currently the most popular version in terms of installations at customer sites, according to Jocelyne Attal, vice president of WebSphere software marketing at IBM. She said many customers started with that version and continue to run it.

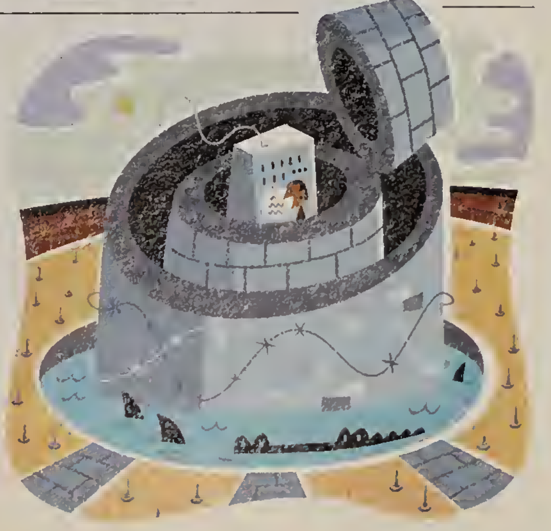
But WebSphere Version 4, which shipped last July, is the prime choice of newer users, Attal said. Version 4 was a major release in which IBM rearchitected and rewrote the product so that the different

WebSphere, page 16

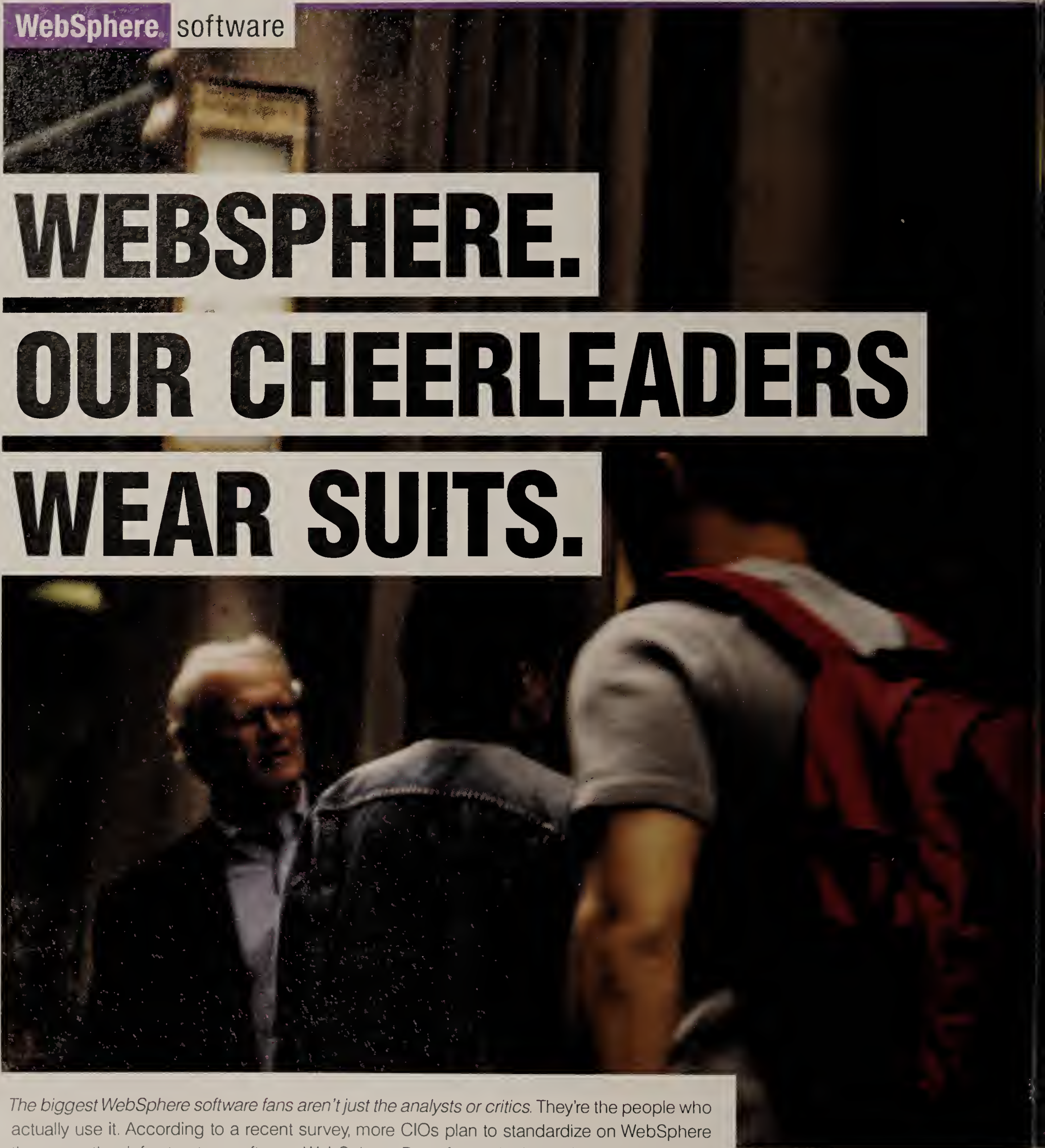
Securing THE Center

Even as the threat of cybercrime increases, companies are finding that they need to provide more access to internal networks for customers and partners. The result is an urgent need for technologies and strategies to protect the data center infrastructure and software that lie at the heart of the enterprise.

STORY BEGINS ON PAGE 56.



MICHAEL BARTALOS



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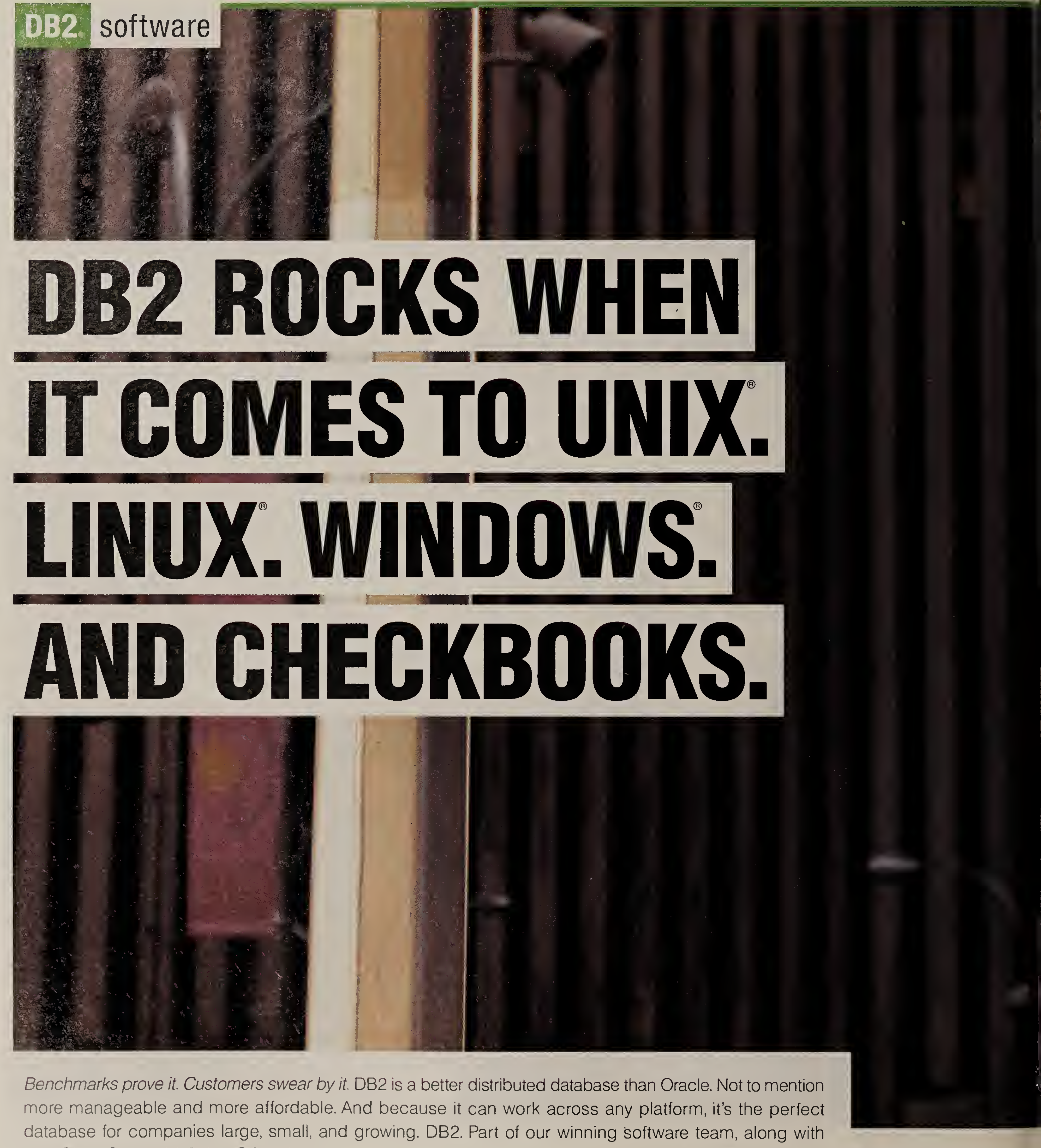

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SETH AFFOUMADO

FAIL-SAFE SOFTWARE ON THE WAY

Computer scientist Richard P. Gabriel (above) is working on ways to create software that will recover automatically when something goes wrong. **PAGE 60**

ROI UNMASKED

JULES FRASIER

CEOs, CFOs and shareholders have become hard-liners when it comes to technology ROI. But as CIOs such as Alaska Airlines' Bob Reeder (left) have discovered, sometimes a spreadsheet doesn't tell the whole story. **PAGE 36**

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COMPUTERWORLD THIS WEEK

NEWS 12

12 Networld+Interop attendees say it's time for the wall between application developers and network specialists to come down.

13 As testimony in the remedy phase of the Microsoft antitrust trial draws to a close, the judge isn't showing any cards.

14 The $6.9 billion outsourcing deal the Navy signed with EDS 18 months ago gains steam after navigating some rough waters.

18 An ITAA study finds that the IT workforce declined by 5% last year, but the association insists that the future is bright.

22 The growing spam problem has corporations and network operators looking to new tools, and even legislators, for help.

BREAKING NEWS

For breaking news, updated twice daily, visit:
QuickLink: a1510
www.computerworld.com

BUSINESS 33

33 Bart Perkins outlines steps you can take in building a supplier portfolio management program to help control IT purchasing costs.

44 IT middle managers are making themselves less vulnerable to layoffs by melding senior management's vision with the groundwork being done by the IT troops.

47 Linux is a lot cheaper to run and maintain on mainframes than across a network of Intel servers, early practitioners are discovering.

49 Your boss is more apt to listen if you appeal to his particular decision-making style, argues Gary Williams, who wrote about it in this month's *Harvard Business Review.*

52 Workstyles: Office Depot's Ingrid Kluth talks about how the IT staff gets to know the business by picking inventory out of warehouses for customers and riding with sales reps to appointments.

TECHNOLOGY 55

55 XML may actually have a use after all, says skeptic Nicholas Petreley.

61 QuickStudy: This week's primer is on Universal Serial Bus, which is a standard for connecting peripheral devices to a computer using a single connector that replaces serial, parallel and network connections.

62 Hands On: Reviews editor Russell Kay looks at rapidly evolving hard-disk technologies.

63 Emerging Technologies: Sorting out the differences among the various wireless LAN standards isn't easy. Here's information that can help you choose which one to implement.

64 Security Journal: Security manager Vince Tuesday discovers that his own company has become an unwitting culprit in a spate of recent spam attacks.

OPINIONS 30

30 Patricia Keefe says no one seems inclined to spell out what various IT and industry groups mean when they cite a skills imbalance between available jobs and the available workforce in the U.S.

30 Pimm Fox tells how Canada's largest retailer got IT vendors to cooperate with one another and focus on its project goals.

31 David Moschella says the telecom industry turmoil is just one more thing IT must live with, given the importance of network service providers to many organizations.

74 Frank Hayes writes that the progress business has made on improving data privacy will be slowed by a mystifying decision recently made by a federal judge.

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TOO MUCH OF A GOOD THING

U.S. companies — especially IT vendors — are world leaders in producing verbose privacy statements, says columnist Jay Cline. Is there an editor in the house?
QuickLink: 29379

BULLY IN THE SCHOOLYARD?

Microsoft has more than the education market in mind as it seeks additional money for unlicensed software from large school districts in the Pacific Northwest.
QuickLink: 29345

WHAT'S A QUICKLINK?

On some pages in this issue, you'll see a QuickLink code pointing to additional, related content on our Web site. Just enter that code into our QuickLink box online, which you'll see at the top of each page on our site.

AT DEADLINE

Cutbacks Expected at IBM After Weak Q1

IBM, which last month reported first-quarter results that were lower than expected, is preparing to lay off 2% to 3% of its 320,000 employees, according to a source close to the company. That would affect as many as 9,600 workers at IBM, which previously had weathered the economic slump better than most of its rivals. IBM declined to comment.

Microsoft Warns of Hole in MSN Chat . . .

Microsoft Corp. issued a software patch designed to fix a security vulnerability in the MSN Chat text messaging technology that comes with its MSN Messenger and Exchange Instant Messenger products. The software vendor assigned a "critical" severity rating to the unchecked buffer hole, which could be used by attackers to run malicious code on unprotected PCs.

. . . While AOL Fixes Vulnerability in AIM

America Online Inc. said it has fixed a buffer-overflow security hole in a part of its instant messaging software that lets users share programs. Dulles, Va.-based AOL corrected the vulnerability within the servers that run its AOL Instant Messenger service, and the unit of New York-based AOL Time Warner Inc. said users don't have to take any action. The hole could have been used to run malicious code.

Short Takes

AMGEN INC., a Thousand Oaks, Calif.-based biotechnology company, has named Hassan Dayem as its CIO. Dayem previously was an IT executive at **MERCK & CO.** in Whitehouse Station, N.J. . . . Lindon, Utah-based software vendor **CALDERA INTERNATIONAL INC.** warned of lower-than-expected financial results and cut its workforce by 15%.

Users Look to Break App, Network Walls

Performance issues mandate cooperation with IT, Networld+Interop attendees say

BY MICHAEL MEEHAN
LAS VEGAS

NETWORLD+Interop isn't known as an application-oriented event, but many IT managers who attended last week's conference here said the barriers between application developers and network specialists must come down so they can work together to avoid performance problems.

Heading off data-processing snags on e-commerce systems and other distributed applications that run across far-flung networks is a big challenge, they said — and the same goes for pinpointing the cause of problems that do occur.

AVIALL'S Lacik involves all of IT in software rollouts to minimize application/network issues.

Joe Lacik, vice president of information services at aircraft parts distributor Aviall Services Inc., said he learned that lesson the hard way after the Dallas-based company installed an online sales portal built around BroadVision Inc.'s e-commerce software in February last year.

For months afterward, Lacik said, Aviall suffered server failures and network clogs. "I felt almost helpless," he said. "Here we've got this application that's central to our entire business turnaround strategy, and I can't put my finger on what's going wrong with it."

Finally, late last year, Lacik found a Java-based tool developed by Austin, Texas-based Covasoft Inc. that troubleshoots software made by Redwood City, Calif.-based BroadVision. Aviall now suffers fewer outages on the e-commerce system and is better able to identify problems when they arise, he said.

In the wake of that experience, Lacik said he treats application rollouts as projects for the entire IT staff, not just individual development teams.

Bruce Alderson, a consultant at Pine Mountain Group Inc. in Groveland, Calif., said many users don't bother to figure out how highly integrated and distributed applications will actually run on their networks.

"Stuff doesn't work across high-latency networks unless you've properly designed and tested it," he said. Alderson, who spoke during a session at the conference, added that the spread of virtual LANs and undocumented connections often makes traditional network mapping a nearly impossible task for IT managers.

Web Services Worries

Anthony Skipper, vice president of architecture for Web services at Merrill Lynch and Co. in New York, came to Networld+Interop to demonstrate how the financial services firm plans to use Web services technology to integrate its various applications. For example, the company will make use of the XML-based Simple Object Access Protocol to pass messages between different systems.

But in advance of the project, Skipper made sure he bought Web services optimization software that's designed to address performance issues and lighten CPU and network bandwidth usage by streamlining application paths. The tool, developed by Atlanta-based Chutney Inc., should be in place by year's end, Skipper said.

"The instant you've got to scale really high, you've got to worry about the performance of your systems, and you've got to get something to help keep your costs down," he said. "A big Web services deployment could create massive server overhead if you're not careful."

Bob Gleichauf, chief technical officer for the security division at Cisco Systems Inc., agreed that Web services in particular could pose new application performance problems for network engineers.

Web services technology is "going to create congestion issues, and it's going to create security issues," Gleichauf said. Users and vendors alike will have to learn how to fix problems as they occur, he added. ◗

All Geared Up

Products announced at N+I included the following:

CISCO A set of intrusion detection tools plus content repositories to help prevent network performance disruptions.

3COM The first switches with support for upcoming software that will let switches in different locations work as a single unit.

NORTEL NETWORKS Technology that lets its routers handle security functions as well.

HEWLETT-PACKARD Switches that can work as simultaneous Layer 2, 3 and 4 devices.

IBM Disaster recovery services that can restore data and applications from remote locations.

RESILIENT NETWORKS

N+I attendees said protecting networks from catastrophe has become a top priority.

QuickLink: 29680
www.computerworld.com

Users: 10 Gigabit Ethernet Can Wait

Networking vendors made a slew of announcements about 10 Gigabit Ethernet technology at Networld+Interop, but their plans didn't generate much excitement among corporate IT managers at the conference.

"I don't believe we have an application out there that's going to demand that kind of bandwidth," said Dan Weegar, director of technology services at Oak Brook, Ill.-based Advocate Health Care Inc., a $2.5 billion not-for-profit company that operates eight hospitals in the Chicago area.

Anthony Skipper, vice president of architecture for Web services at Merrill Lynch, voiced a similar opinion. The 10 Gigabit Ethernet technology "is good for an [application service provider] or a [network] carrier, but I don't think the rest of the world needs it right now," he said.

Vendors such as 3Com Corp. in Santa Clara, Calif., and Nortel Networks Ltd. in Brampton, Ontario, detailed plans to offer 10 Gigabit Ethernet switches, while Intel Corp. announced a single-chip controller for the technology. In general, the vendors said they will be fully ready to push 10 Gigabit Ethernet equipment by the end of next year.

Robin Layland, an independent networking consultant in West Hartford, Conn., said he thinks the strategy behind last week's announcements "is really more about trying to sell Gigabit [Ethernet] on the desktop." To run that, he added, users need network bandwidths to be an order of magnitude larger in their data centers.

Bill Alderson, a consultant at Pine Mountain Group, said users whose networks are suffering from application performance problems shouldn't assume that they can be fixed by just increasing bandwidth. Applications usually bog down more as a result of network complexity than because of speed limitations, he said.

Joe Lacik, vice president of information services at Aviall Services, echoed that sentiment. "Nine out of 10 times the problem is that it's a poorly written application, not that there's a problem with the network," Lacik said.

– Michael Meehan

Next Move in Antitrust Case Up to Judge

Microsoft remedy phase set to wrap up

BY PATRICK THIBODEAU
WASHINGTON

Testimony in the Microsoft Corp. antitrust trial ended last week, with both sides having little indication regarding how U.S. District Judge Colleen Kollar-Kotelly may rule.

Kollar-Kotelly faces tough choices. None other than Chairman Bill Gates has warned her that if Microsoft is forced to produce a stripped-down version of Windows, it will mean the end of the operating system.

But the heart of the nonsettling states' case is the provision that would allow PC makers to substitute Microsoft applications, such as its browser or media player, with rival software. The nine nonsettling states and the District of Columbia see that as critical to restoring competition.

Kollar-Kotelly has favored Microsoft in many of her procedural rulings, according to legal experts and people close to the case. But it's unclear whether she is signaling sympathy for the software maker, or just acting carefully and closing off Microsoft's potential avenues of appeal.

End users won't be affected for some time. A final decision could come as early as late summer, but it will most likely be appealed.

Kollar-Kotelly's job is to decide whether to accept or reject the settlement reached with Microsoft by the Bush administration and nine of the 18 states originally involved in the antitrust case. That settlement is the baseline — the pressure has been on the nonsettling states to make a better case in this proceeding.

"The states do bear the burden of proof. And that's the big difference," said Andy Gavil, an antitrust professor at Howard University School of Law in Washington. "They have to establish that additional remedies are needed."

Along with a stripped-down version of Windows, those additional remedies include forcing the porting of Office to other operating systems, making Internet Explorer open source and more disclosure of Windows technical information.

Shevin Conway, vice president and CTO at Empire Blue Cross Blue Shield in Melville, N.Y., said that porting Office to other operating systems would be a good move. "Software should be something that's available across multiple environments," said Conway, who added that Microsoft has shown it has the ability to do so by porting Office to the Macintosh.

Despite the lack of clear signals from Kollar-Kotelly, legal experts doubt she will go as far as ordering the porting of Office and other sweeping remedies. Kollar-Kotelly has narrowed the scope of the remedy phase, and that could mean a limited final order.

"This judge didn't allow hearsay and other inappropriate statements into the record," said Hillard Sterling, an antitrust expert at Chicago-based Gordon & Glickson LLC. "That alone should help Microsoft secure an order it can stomach."

But Kollar-Kotelly may be more comfortable with the states' provisions to toughen the proposed settlement, such as the appointment of a special master to oversee the case.

The settlement "screams for that" oversight, said Dana Hayter, an attorney at Howard, Rice, Nemerovski, Canady, Falk & Rabkin P.C. in San Francisco and a former U.S. antitrust attorney. Under the proposed settlement, a technical committee monitor Microsoft's compliance with the remedy.

"But the technical committee doesn't report to the judge; the judge has no way to know whether Microsoft is complying with the settlement agreement," Hayter said. ◗

Reporter Carol Sliwa contributed to this story.

AT A GLANCE

Monopoly Game

Microsoft was found by the U.S. Court of Appeals to have illegally maintained a monopoly. The Bush administration has reached a settlement with the firm, but nine states want tougher remedies.

1. FIRST THROW OF THE DICE: Microsoft went into this case a few moves ahead. Trial Judge Thomas Penefield Jackson, who wanted Microsoft broken up, was removed from the case for out-of-court comments. The settlement plan the Bush administration produced would have a limited impact on the company's operations.

2. "JUDGE IS NICE" CARD: Judge Colleen Kollar-Kotelly's courtroom rulings have favored Microsoft.

3. GO BACK THREE SPACES: Some of Microsoft's witnesses didn't hold up well under cross-examination. An economist, for instance, retreated on the key charge.

4. "GET OUT OF JAIL" CARD: Legal experts see Kollar-Kotelly acting in a limited way on Microsoft. But the outcome is still a question mark.

COURT REPORT

For complete *Computerworld* coverage of the Microsoft antitrust trial, visit:

QuickLink: s1100
www.computerworld.com

California Firestorm Threatens Oracle Deal

Users: Problems show importance of doing homework before signing contracts

BY MARC L. SONGINI

A controversial database licensing deal between Oracle Corp. and California's state government was on the verge of unraveling last week, and some IT managers said the fiasco illustrates all too painfully what can happen when a technology rollout isn't vetted carefully enough upfront.

That warning applies to both private- and public-sector projects, according to users and industry analysts.

"This is not a new story," said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Daly City, Calif. "Like a lot of companies, the state didn't obtain the right amount of consensus and didn't have the right review process. Anyone who thinks this is unusual doesn't understand how governments and companies obtain software."

Oracle continued to defend the $126 million enterprise license agreement last week, but it also offered to undo the contract if a deal could be worked out with a reseller and a financing firm. California Gov. Gray Davis' office confirmed that efforts to rescind the contract were under way.

The fallout from the controversy includes resignations of state officials and the possible elimination of California's central IT agency (see chart).

Some Oracle users said they think the state is largely to blame because the agencies that negotiated the contract didn't do their homework.

"My opinion is that Oracle saw a sucker coming and took advantage of it," said Mark Paris, information services manager at Kleinfelder Inc., a San Diego-based construction management and engineering services firm that uses Oracle's databases. Oracle is trying to do something similar at Kleinfelder by "strong-arming us into buying more license seats than we need," Paris said.

Oracle officials declined to comment on the company's sales tactics in general or to address any specific situations. But in March, after Stamford, Conn.-based Gartner Inc. claimed that Oracle's sales force was trying to sell companies more database licenses than they needed, Oracle said it "does not condone or encourage" such behavior.

Oracle's salespeople are aggressive, said Michael Schiff, an analyst at Current Analysis Inc. in Sterling, Va. But Schiff, a former employee of Oracle's government unit, added that the sales force at that operation always appeared to be ethical when dealing with users.

"One thing for users to do is recognize that it's a salesman's job to sell," Schiff said.

Pat Dues, a project manager in the Las Vegas city manager's office, said she's uncertain how a contract as large as the one between Oracle and the California government could have been approved without officials asking detailed questions about return on investment and cost comparisons with other databases. The government in Las Vegas uses Oracle's database and its business applications. ◗

Contract Trouble

Some key developments in the California database licensing controversy:

- California's state auditor said last month that the Oracle licensing agreement could **cost more money** than regular software licenses.
- Oracle still claims the deal **"delivers great value,"** but it and a reseller involved in the contract offered to rescind the agreement last week.
- The director of California's Department of Information Technology **was suspended**, and two other state officials **have resigned.**

ORACLE STATES ITS CASE

The vendor will give up the contract but says it provides "great value" to state agencies.

QuickLink: 29675
www.computerworld.com

Huge Navy IT Outsourcing Deal Passes First Hurdle

Multibillion-dollar Navy/Marine Corps Intranet given OK, but challenges remain

BY DAN VERTON

SENIOR PENTAGON officials have handed the U.S. Navy a major victory for its $6.9 billion intranet program, granting the service permission to continue with the massive outsourcing deal and order an additional 100,000 seats.

John Stenbit, CIO at the U.S. Department of Defense, approved on May 3 the continued rollout of the Navy/Marine Corps Intranet (N/MCI) after the prime contractor, Plano, Texas-based Electronic Data Systems Inc., successfully passed initial tests conducted on 60,000 pilot seats. However, Navy officials and outside experts acknowledged that the program still faces significant challenges, particularly in the areas of change management and legacy system integration.

OUTSOURCING

A contract that was awarded to EDS in October 2000 calls for the N/MCI to replace an estimated 200 Navy and Marine Corps networks with a single network owned and operated by EDS. When fully rolled out in 2005, N/MCI will represent one of the largest outsourcing contracts in government history, covering more than 400,000 desktops.

The challenges facing the Navy's IT personnel aren't just technological, said N/MCI program director, Rear Adm. Charles L. Munns.

"One of the largest challenges the Department of the Navy faces in implementing the Navy/Marine Corps Intranet is cultural," said Munns. "And the largest cultural challenge is the replacement of local control with centralize policy, standards and control of resources. This is an ongoing, iterative process similar to our transition from sail to steam, but we made that one and we'll make this one."

"The cultural change required by N/MCI is still the biggest challenge for EDS," said Olga Grkavac, executive vice president of the enterprise solutions division at the Information Technology Association of America in Arlington, Va. But that's not surprising, said Grkavac, who has been following the N/MCI contract closely.

"In a private company, you would have the CEO and CFO saying that this is the way it has to be, which is harder for the Navy," Grkavac said. "They will always have some complaints going to Congress and the press, which would not happen often at a Fortune 100 company."

A senior Navy official with knowledge of the program agreed that "Navy employees are still in the process of seeing the benefits."

The official, who spoke on condition of anonymity, added that Navy employees' perceptions of the program's success likely depend on whether or not their organizations currently enjoy good IT support. The IT "have-nots should be most pleased" by the upgrades, said the official. However, "the haves" see more to worry about. Part of that concern also stems from the massive challenge of integrating legacy systems into the new, more secure N/MCI architecture.

"There are a ton of legacy systems and thousands of applications," said Grkavac. "More than even the Navy anticipated."

However, Rick Rosenburg, EDS program executive for N/MCI, said the Navy's decision to bring a two-star admiral in to run the program indicates its commitment to ensuring that the required cultural change occurs.

As for legacy applications, Rosenberg said the Navy is putting in place a process called "ruthless rationalization," the objective of which is to go from the more than 60,000 applications currently in place to fewer than 10,000 — the goal is 1,000. ◗

N/MCI Locales

NEXT SIX SITES:

- **Commander in Chief Atlantic Fleet Headquarters,** Norfolk, Va.
- **Space and Naval Warfare Systems Command Information Technology Center,** New Orleans
- **Readiness Command South,** New Orleans
- **Space and Naval Warfare Systems Command Headquarters,** San Diego
- **Naval Surface Warfare Center,** Port Hueneme, Calif.
- **Naval Air Station,** Fallon, Nev.

SECURITY CLEARANCE

Q&A: EDS's Al Decker answers security and privacy questions.

QuickLink: 29639

History: For more about N/MCI, visit:

QuickLink: a2020
www.computerworld.com

Oxford Health Pulls Plug On Pact, Will Move IT In-house

HMO cancels deal with CSC, expects to reduce costs

BY LINDA ROSENCRANCE

Less than two years after signing an IT outsourcing agreement with Computer Sciences Corp. (CSC), health maintenance organization Oxford Health Plans Inc. has canceled the deal.

Oxford's agreement with El Segundo, Calif.-based CSC included data center operations, help desk services, desktop systems and network operations and was reported to be worth $270 million to $330 million.

Oxford spokeswoman Deborah Abraham said the Trumbull, Conn.-based health care provider ended the deal last month after determining that it would be more cost-effective to bring the outsourced IT functions back in-house. The business environment as well as the HMO's strategic goals have changed since Oxford signed the agreement in November 2000, she said.

"The original deal was for limited operations," Abraham said. "The company is now entering a growth phase, and bringing these [IT functions] back internally gives us more flexibility to redeploy personnel from one department to another, and will be more cost-effective."

During the outsourcing engagement, Oxford's IT department continued to handle the HMO's application development and maintenance, database administration, quality assurance, program management and architecture. Oxford had hoped to save money and upgrade its technology capabilities through the outsourcing agreement.

Abraham said that most of the workers who had moved from Oxford to CSC as part of the original arrangement would be offered jobs at the HMO. Originally, about 200 employees moved to CSC as part of the outsourcing deal. Abraham said she didn't know how many were still working at CSC.

CSC spokesman Frank Pollare said Oxford didn't end the deal because it was dissatisfied with CSC, adding that the HMO went through a change in management.

Tom Goetzinger, an analyst at research firm Morningstar Inc. in Chicago, said Oxford signed the outsourcing agreement early in its restructuring, but now that the company is experiencing a period of growth like other health insurers, it probably figured it could save money by bringing the outsourced IT functions back in-house. ◗

OXFORD BLUES

For more on Oxford Health Plans' outsourcing deal with CSC, visit our Web site:

QuickLink: a2030
www.computerworld.com

OXFORD'S OUTSOURCING TIMELINE

Nov. 2000	Dec. 2000	Dec. 2001	April 2002
Oxford Health signs five-year IT outsourcing deal with CSC valued at $270 million to $330 million.	Approximately 200 Oxford IT workers move to CSC.	Transition process for IT functions was expected to be completed.	Oxford ends outsourcing agreement with CSC.

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Continued from page 1

WebSphere

versions of WebSphere all use the same code base, she said.

Attal advised WebSphere 3.5 users to leapfrog to Version 5, which is expected to ship in the third quarter, rather than move first to Version 4. "The effort will be exactly the same, and they will benefit from the quality of service and more functionality," she said.

But some users may be wary of jumping that far forward. Claudia Radasanu, senior vice president of development services at Toronto-based TD Bank Financial Group, said that more than any new feature, "there is nothing more compelling than [round-the-clock] availability."

"We have mission-critical applications running on [WebSphere 3.5.6] that face customers, and we cannot jeopardize their experience," she added.

Radasanu said her firm investigated a move to Version 4.1 to take advantage of features that ease development. But moving all the way to Version 5 would require a "compelling reason" and "enough proof of stability." Right now, she said, she doesn't have that.

Shevin Conway, vice president and chief technology officer at Empire Blue Cross Blue Shield in Melville, N.Y., said application servers are large and complicated products, and his firm typically doesn't implement the first release of any new version.

'Let Somebody Else Do It First'

Conway said he would rather "let somebody else do it first," because he needs WebSphere to run mission-critical member, provider, employer and broker portal sites with the potential of 4.4 million users seeking access at any one time. He said that since existing applications aren't designed to take advantage of any new services in the new product, "moving to that version immediately is really not that important."

Rather than do a straight upgrade, Conway said, he built a second environment in which he does a fresh installation of a product. Then he starts migrating applications to that environment to validate that all the pieces will actually run on the new version, "because doing an upgrade doesn't mean it's going to work," Conway said.

Matthew Mulrooney, an e-business developer at a major oil company that he asked not be named, said he hasn't even thought about Version 5 because he hasn't had time and, more important, because his firm uses a version of IBM's Portal Server that will run only on earlier versions of WebSphere. He said his firm will soon move from WebSphere 3.5.4 to Version 4, mainly for the newer edition's compliance with the Java 2 Enterprise Edition 1.2 specification.

"We are particularly looking forward to the streamlined deployment model in Version 4," Mulrooney said. "It will certainly decrease our administrative burden and make application packaging much more consistent."

WebSphere 5.0

NEW FEATURES INCLUDE:

- Support for latest Web service standards, such as SOAP, UDDI and WSDL
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- Native Java Message Service implementation
- Tool kit to visually create adapters based on J2EE Connector Architecture
- Support for Java Management Extensions

Although some users may be hesitant to leap from WebSphere 3.5 to 5.0, some analysts said taking that path would make more sense than moving to Version 4.

"With IBM neck and neck with BEA, IBM is going to be acutely aware that they really have to have 5.0 ready to go. It can't be buggy, or they'll really start to sacrifice market share and leadership to BEA," said Tyler McDaniel, an analyst at Hurwitz Group Inc. in Framingham, Mass.

Thomas Murphy, an analyst at Stamford, Conn.-based Meta Group Inc., said the vast majority of users employ Java Server Pages and servlets, and moving to WebSphere 5 would bring them the latest versions of that technology.

"There's no real reason to stop at 4," he said.

However, Mike Gilpin, an analyst at Cambridge, Mass.-based Giga Information Group Inc., said users shouldn't skip WebSphere 4.

"Best to migrate to a release that has more time under its belt," he said. "This is common practice for infrastructure in IBM shops and other conservative organizations." ◗

IBM Bangs Integration Drum

SAN FRANCISCO

Easing integration while reducing its cost was a big theme at IBM's DeveloperWorks Live conference here last week.

With that in mind, the company launched a bevy of new and enhanced products, which included the following:

- WebSphere MQ Event Broker, a software product that lets businesses publish information to subscribers based on their individual preferences. The information can be delivered in real time across an internal network, the Internet or wireless devices. The new product is expected to ship this month. Pricing will start at $20,000.
- WebSphere Business Integration Version 4.1, which aims to help companies implement and simplify business processes across multiple applications, such as customer relationship management and enterprise resource planning systems. The product, which is available now, combines functionality from IBM CrossWorlds InterChange Server, WebSphere MQ Integrator Broker and MQ Workflow.

When considered in conjunction with its WebSphere Application Server, IBM's integration product array gives the company an edge in depth and breadth over San Jose-based rival application server vendor BEA, said Tyler McDaniel, an analyst at Hurwitz Group.

IBM has "been in pretty good position, and they're continuing to execute well now," said Thomas Murphy, an analyst at Meta Group, commenting on IBM's "comprehensive set" of integration products.

– Carol Sliwa

Continued from page 1

IBM Server

Some Sequent users are clearly agitated.

"IBM's actions have left us with a very bad taste in our mouths for anything IBM," said Michael Wojtowicj, manager of systems engineering at Entertainment Partners, a Burbank, Calif.-based company that provides production management services in the entertainment industry.

The company has been a Sequent customer since 1989 and uses several NUMA systems and Dynix/ptx to run all of its core applications. Now it's being forced to rewrite all of its applications in Java and C to enable a migration to a new platform.

"I think IBM's objective was to first trap customers on this platform and then force them to move to [IBM's] Unix boxes," Wojtowicj said.

The move has been expected for some time because of both the lack of customer response to the NUMA box and the lack of software and database support around Dynix/ptx, said Michael Prince, vice president and CIO at Burlington Coat Factory Warehouse Corp. in Burlington, N.J.

Nonetheless, "it's disappointing that this happened," said Prince. He added that his company has a "significant investment" in Sequent's NUMA systems, which it uses as database and application servers.

Pulling the Plug

With IBM pulling the plug, Burlington Coat Factory is considering moving everything to a cluster of smaller Unix or Linux servers. That task is complicated by the company's planned upgrade to Oracle9, Prince said. Moving off the NUMA boxes, adds a significant amount of extra work, Prince said.

Starting Dec. 31, IBM will stop selling both the server and the operating system, though it will continue to support Dynix/ptx through 2006 and the hardware through 2007.

Sequent's NUMA technology allowed the company to assemble very large Intel boxes using four-processor building blocks.

Although Sequent never managed to find a large market for its products, it did snag several big-name customers, such as The Boeing Corp. and Carlson Hospitality Worldwide.

When IBM acquired Sequent for $810 million in 1999, the company said it would use NUMA to deliver very large Intel boxes. The xSeries 430 server, which started at $160,000 for an eight-way system, was expected to be the first in a line of even larger Intel boxes.

IBM is now urging users to move their applications to its 32-way p690 Unix/RISC servers or to smaller four- or eight-way Intel boxes.

An IBM spokesman last week characterized the move as a routine product withdrawal. Though it formally announced the withdrawal in March, IBM has been contacting customers about the move since last year, he said.

"We do these things all the time. We replace technologies with new technologies. . . . We view this as a product evolution," the spokesman said. "We are giving our customers plenty of time to execute a migration strategy. And we'll continue to support their migration [to other technologies]." ◗

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IT Job Market Dips; No Upswing in Sight

Technical support and customer service positions both suffered heavy job losses

BY JULIA KING
ARLINGTON, VA.

THE GOOD NEWS is that U.S. companies hired 2.1 million IT workers last year.

The bad news is that they fired 2.6 million, reducing the overall IT workforce by about 5%, from 10.4 million to 9.9 million workers, according to a national IT workforce study released here last week by the Information Technology Association of America (ITAA).

At the top of companies' 2001 layoff lists were technical support workers, whose ranks were reduced by more than 911,000 positions. Other losing job categories included software programmers/engineers and database developers, which lost 487,000 and 445,000 jobs, respectively.

The groups that lost the fewest jobs were digital media specialists, technical writers and enterprise systems support workers.

Results of the ITAA study were based on interviews conducted in February and March with 532 hiring managers at companies with more than 50 employees.

According to ITAA President Harris Miller, hiring managers rated specific industry and technical experience as the top factors they considered when interviewing IT job candidates. Less important were technical certifications and general work experience.

This doesn't bode well for the millions of graduates from colleges and technical study and certification programs who are entering the job market. Adding to their struggle is the ITAA's finding that companies are targeting traditional entry-level IT departments like the help desk and customer service for reductions.

"Entry-level positions have been reduced significantly" since early 2001, said Scott Melland, president of Dice Inc., a New York-based online job posting service.

Despite the grim numbers, hiring managers in the ITAA's survey said they expect to create about 1.1 million IT jobs within the next year. But due to a so-called skills imbalance, they expect about 600,000 of those jobs to remain unfilled.

Ron Fijalkowski, CIO at Strategic Distribution Inc., a $300 million supplier of manufacturing maintenance and repair parts in Feasterville, Pa., questioned the ITAA's report.

"I don't think those numbers are at all realistic," said Fijalkowski, noting that his company has no plans to hire new IT employees. "We have not let the water start flowing to go after projects on hold."

Fijalkowski is also skeptical about a skills imbalance.

"There are Java developers and skilled Microsoft individuals available for hire," he said. "I'm also getting numerous calls from [outsourcing firms] seeking work — and that includes offshore firms seeking work. I absolutely don't see an uptick in demand going on."

There are signs that IT jobs are returning, said Joanne Peterson, president of Abator Information Service Inc., an IT recruiting firm in Pittsburgh. But Peterson also said she doubts the ITAA's arithmetic, specifically its claim that as many as 600,000 jobs will go unfilled due to a lack of qualified candidates.

"I think we could staff every real job that is open with people who are not working," Peterson said. "I don't think we need to go to India to get a job filled." ◗

Reporter Brian Sullivan contributed to this story.

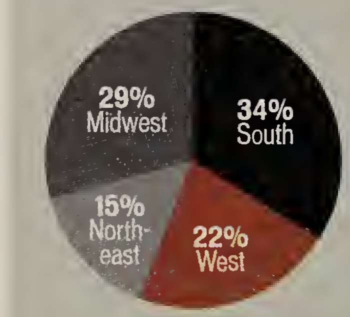
Key Findings From The ITAA's Survey

HOW THE AX FELL:

- IT companies cut **15%** of their IT workers, while non-IT companies laid off only **4%** of IT workers.

WHERE THE JOBS ARE:

- IT work appears to be migrating south. Demand for IT workers in the Midwest and West has fallen since 2000. **Here's a breakdown** of where the IT jobs are:



Manpower CEO Says H-1B Still Needed

Jeff Joerres is chairman and CEO of Milwaukee-based Manpower Inc., an $11.8 billion staffing services firm that counts among its clients 98 of the Fortune 100. He spoke last week with *Computerworld*'s Don Tennant about some of the more controversial staffing issues facing IT professionals.

What's your response to the unemployed U.S. IT worker who resents the fact that the government is issuing H-1B visas to import IT talent? We have to continue it at a certain level, albeit maybe at a smaller one, but the visa policy must continue. We have to bring talent into the organization. [Unemployed U.S. IT workers] may not have the right skills. They may not have the mobility. When push comes to shove, they're not going to move to Des Moines. Someone from India might say, "I'm an SAP programmer; I'll move to Des Moines."

JEFF JOERRES

What's the most common IT staffing concern that you hear? That there is still a complete reluctance on the part of senior management to want to do anything with IT. There is still this Y2k hangover. I feel as though there is an attitude [among senior managers that] "IT is extremely important – it gives me an awful lot of savings. But I still can't feel that real trust that the money I'm putting in, which is always [increasing], is really coming back. So I'm going to hold off for a while."

GET THE WHOLE STORY

Read the complete text of the interview with Joerres online:

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Radar Detectors Zap Credit Card Transactions at Pump

BY BOB BREWIN

ChevronTexaco Corp. has determined that radar detectors are interfering with the satellite system it uses to transmit credit card information from gas stations to back-end corporate systems.

ChevronTexaco, which operates a nationwide network of 6,600 very small aperture satellite terminals (VSAT) at its gas stations, documented the problem last month in a filing to the Federal Communications Commission.

The interference from radar detectors "frequently causes a disruption in the data flow, which can result in lost or incorrect sales and/or verification information," David Heck, manager of marketing, legislative and regulatory affairs at San Francisco-based ChevronTexaco, wrote in the filing.

Heck added that ChevronTexaco is also concerned that "thieves could use these devices to steal motor fuel by simply activating a radar detector while fueling" to knock out a credit card transaction.

David Zatloukal, vice president of Direcway VSAT service at Germantown, Md.-based Hughes Network Systems Inc. (HNS), said the interference from the 25 million radar detectors in the U.S. has rendered "unusable" the lower portions of the 11-GHz spectrum used by the satellites that transmit VSAT data.

Even though they are receivers, radar detectors contain oscillators that can knock out VSAT transmissions to the extent that "we don't know if we can provide satisfactory service," Zatloukal said. HNS, which supplies VSAT services to ChevronTexaco, has tried to buy satellite service in a higher portion of the 11-GHz band but has had difficulty acquiring that limited capacity.

Consequently, ChevronTexaco, HNS and satellite companies such as PanAmSat Corp. in Wilton, Conn., have endorsed an FCC plan to restrict radar detector emissions. Greg Blair, president of Escort Inc., a radar detector manufacturer in West Chester, Ohio, said his industry can't afford regulation of a $39 product and is willing to move to lower frequencies in the 11-GHz band. HNS, in a filing with the FCC, said this would just result in interference with other satellite bands.

The FCC is expected to rule on the issue late this summer or early fall. ◗

SPECTRUM WARS

The FCC will rule on spectrum issues beyond the radar detector problem.

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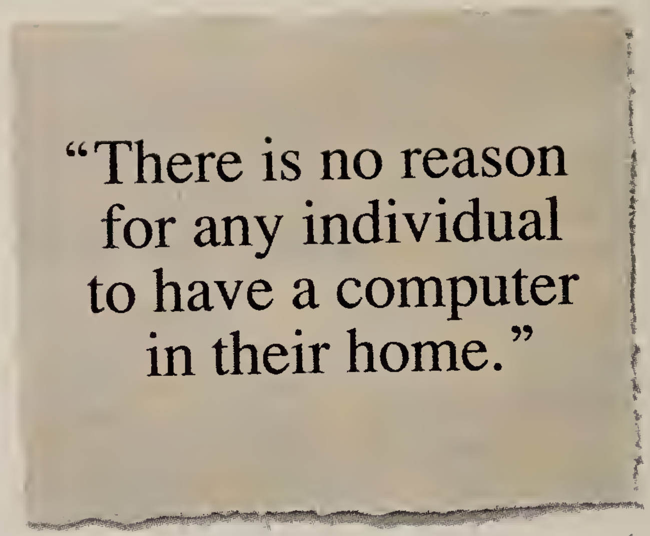
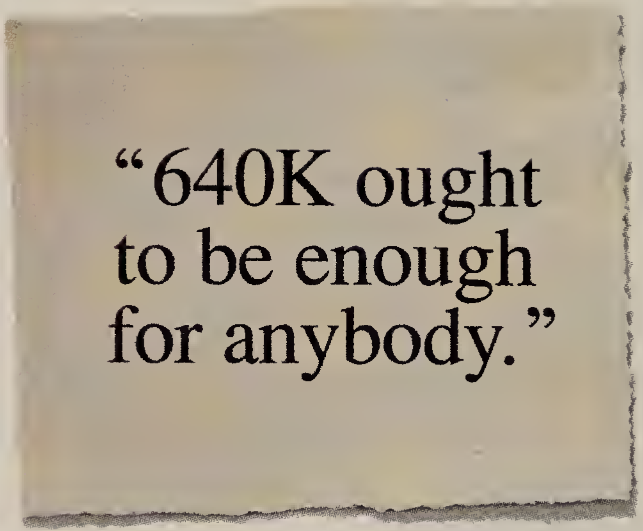
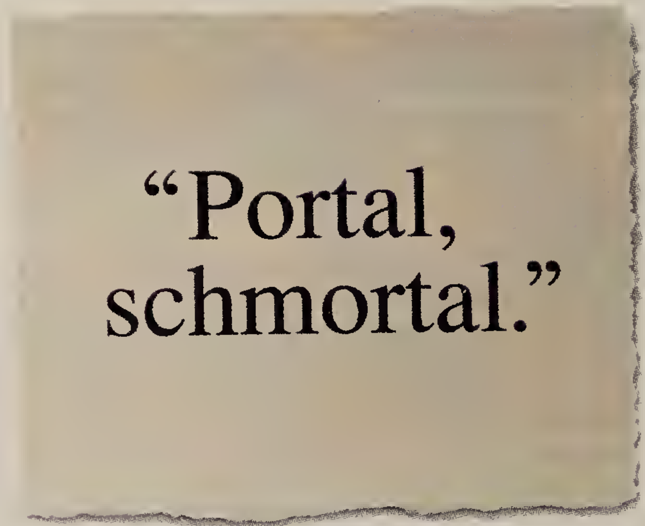

“There is no reason for any individual to have a computer in their home.”

1977


“640K ought to be enough for anybody.”

1984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BRIEFS

Viacom Outsources IT Operations to IBM

Entertainment conglomerate Viacom Inc. signed an IT outsourcing and technology services deal with IBM, which will take over management of the New York-based company's data center, help desk and call center operations. IBM said it will also set up a unified IT architecture for Viacom's different business units. The financial terms of the seven-year deal weren't disclosed.

Lawrence Livermore Names Full-time CIO

The U.S. Department of Energy's Lawrence Livermore National Laboratory named Kenneth Neves, previously director of computer science research at The Boeing Co. in Chicago, as its first full-time CIO. Neves, who starts his new job June 24, will be responsible for the Livermore, Calif.-based lab's IT infrastructure and security. Previous CIOs there also had other duties.

Microsoft Adds Dev Tool to SQL Server

Microsoft Corp. released an application development tool that's supposed to generate much of the code needed for data analysis applications built on its SQL Server database. Licensed users of SQL Server 2000 Enterprise Edition can download the tool at no extra cost. Microsoft also said it will ship an upgrade of its project management software next month.

Short Takes

San Jose-based EBAY INC. said it plans to use Mountain View, Calif.-based VERISIGN INC.'s authentication services to check the addresses and phone numbers of sellers using its online auction site. . . . A U.S. Bankruptcy Court judge approved the sale of Ashburn, Va.-based [illegible] INC.'s European units to a group led by U.S. and Israeli firms.

Spam, Efforts to Fight It Both on the Rise

Companies look for new ways to keep unwanted bulk e-mail off their networks

BY JENNIFER DISABATINO

THE INCREASING pain of dealing with unsolicited bulk commercial e-mail, commonly known as spam, is prompting new moves to stamp out the unwanted messages. But industry experts warned last week that proposed legislative approaches to the spam problem won't likely succeed without the aid of corporate users.

Some service providers have had enough. For example, Fairport, N.Y.-based PaeTec Communications Inc. last week said it had disconnected a direct e-mail marketing company from its broadband network after a New York appeals court overturned an injunction that had prevented it from doing so.

And late last month, San Mateo, Calif.-based UltraDNS Corp., which manages Internet domains and directories for companies, called for the creation of an industry consortium to lobby for the passage of antispam legislation.

But until businesses lay out the true costs of the spam that bombards their internal networks, it will be difficult, if not impossible, to craft useful legislation, said Ray Everett-Church, co-founder and counsel of the Coalition Against Unsolicited Commercial Email. "The largest challenge in fighting for sound antispam legislation is getting the involvement of major corporations," said Everett-Church, whose organization advocates for such measures.

Most companies don't want to disclose what spam costs them on the receiving end, said Michele Rubenstein, a board member of the EMA Forum within The Open Group consortium in San Francisco. The EMA Forum is a group of users and vendors that addresses messaging technology issues.

"A lot of people are reluctant to admit that kind of information," Rubenstein said. "It's kind of like admitting your network has been hacked."

Raymond Huff, president of Trans Pacific Stores Ltd. in Lakewood, Colo., said he was able to stem the influx of spam three months ago by limiting the publication of employees' e-mail addresses on the Internet. But since then, the spam problem has gotten "five times worse" for the convenience store operator, he said.

Spam on the Rise

The incidence of spam is doubling every six months, according to David Ferris, an analyst at Ferris Research Inc. in San Francisco. Data from Brightmail Inc. backs up that claim: the San Francisco-based company said its antispam software measured 4.3 million spam blasts last month, up from 1.7 million in October.

UltraDNS CEO Ben Petro said the removal of spam from its network cost more than $300,000 in lost revenue last month, because some customers were blocked from sending mail to some domains Petro said UltraDNS is targeting California and Delaware for possible state-level laws against spam, since so many companies are incorporated in those states.

Two bills that would set federal antispam provisions have been introduced in the U.S. Senate this year (see chart). But Everett-Church said those measures could actually "legitimize some of the most egregious spam being sent."

Any legislation that gives individuals and companies the ability to fight the onslaught of spam "would be very welcome," said a spokesman at Kmart Corp. in Troy, Mich. "Even if it scares off 10% of the [spammers], that would help."

Kmart, which acts as an Internet service provider through its BlueLight.com LLC unit in San Francisco, takes "extensive steps" to avoid spamming customers, the spokesman said. But the spam that they receive from other sources "dilutes our message," he said. "At the end of the day, it hurts our bottom line." ◗

Spam Measures

The Senate Commerce Committee is considering two antispam bills:

A bill proposed by Sens. Conrad Burns (R-Mont.) and Ron Wyden (D-Ore.) would:

- Require e-mail marketers to include a working return address so recipients can refuse additional messages.
- Prohibit the use of phony or misleading subject headers in commercial e-mail messages.
- Give the Federal Trade Commission authority to impose fines of up to $10 per infringing e-mail.

A privacy-related bill proposed by Sen. Ernest "Fritz" Hollings (D-S.C.) would:

- Create a federal standard to protect personal data, including the use of contact information.
- Require recipients to "opt in" before companies can send commercial messages to them.
- Let spam recipients claim up to $200 if the FTC collects civil penalties or up to $5,000 if they pursue a case themselves.

Users Take Own Blocking Approaches

While legislation may help companies fight spam, analysts said technology is also necessary. But for some users, that means taking matters into their own hands.

"There are many things that need to be done to bring spam under control," said David Ferris, an analyst at Ferris Research. Vendors such as Brightmail and Redwood City, Calif.-based Postini Corp. offer e-mail filtering software, which Ferris said can limit the amount of spam that gets through.

"Instead of getting 200 spam messages, you'll get 40," he said. But, he added, the filters aren't very sophisticated – they often block legitimate messages and let a lot of spam go by unchallenged.

Carlson Leisure Group, the leisure travel unit of Carlson Cos. in Minneapolis, strictly guards against spamming potential customers, said Gino Giovannelli, director of interactive marketing at the Carlson-owned Radisson Hotels and Resorts. The leisure unit is currently developing a tool aimed at preventing its various operations from overloading customers who have chosen to receive messages, Giovannelli said.

The software is already being used to manage postal mailings and should be ready for e-mail use by year's end. Giovanelli said the tool helps identify the customers who are most likely to take advantage of specific promotional offers and ensures that an individual receives only a handful of mailings during a given time period.

Other companies are employing more manual methods to try to avoid getting or sending spam. For example, a Kmart spokesman said the retailer is replacing its all@bluelight.com internal e-mail distribution list because Internet spiders have found that address and spammers are using it to blast out messages to the entire company.

MindShare Design Inc., a San Francisco-based company that manages e-mail marketing campaigns, said it was getting so many spam-related complaints from Internet service providers that it now requires its clients to document how they get the e-mail addresses of intended recipients.

– Jennifer DiSabatino

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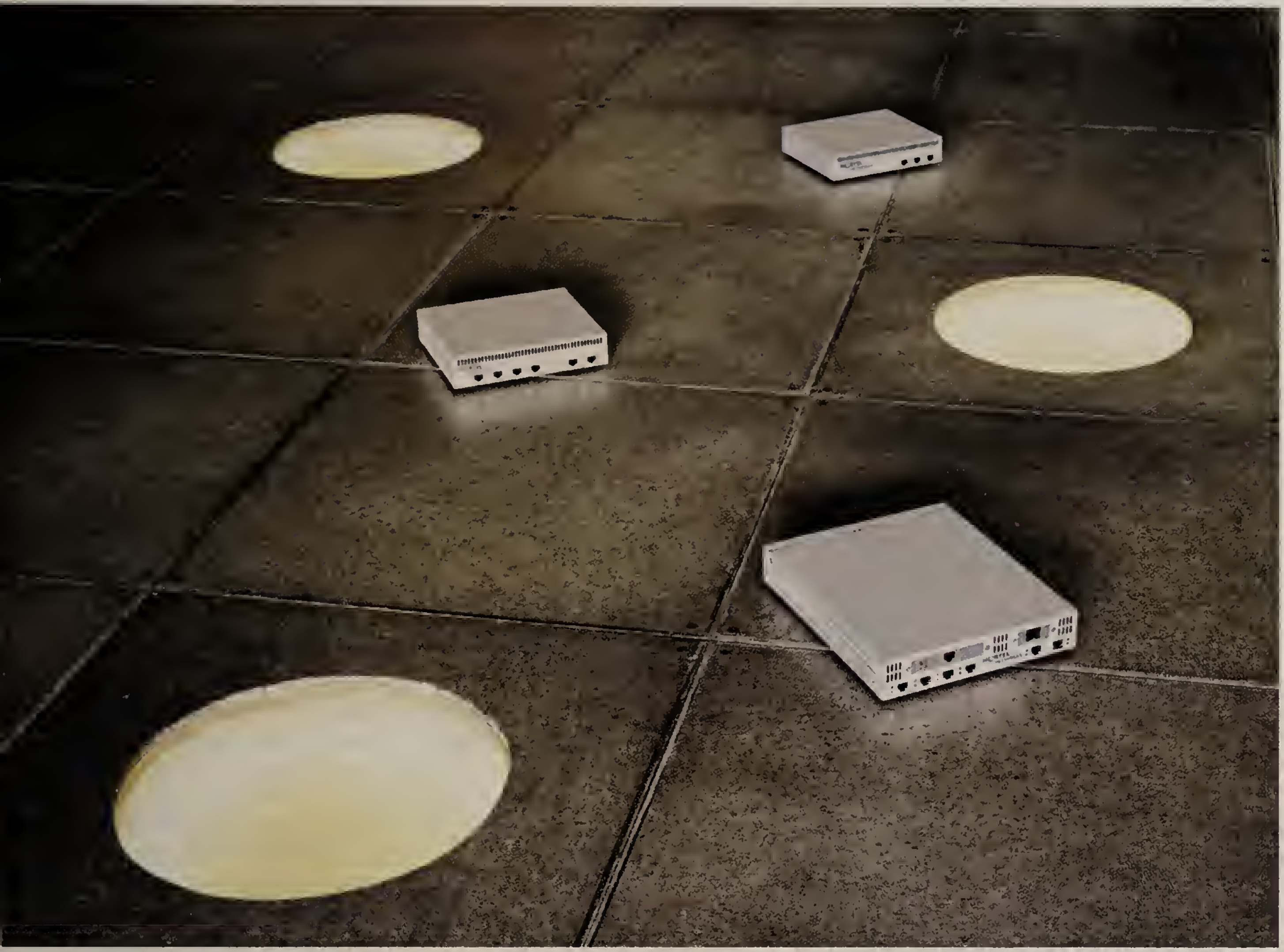

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Energy Industry Companies Set to Adopt E-Signatures

New digital certificate technology will support online power trading

BY MICHAEL MEEHAN

GIVING DIGITAL signatures one of their biggest endorsements to date, some energy companies plan to convert to new digital certificate technology with built-in electronic signature specifications to process their online power trades.

New York-based Identrus LLC announced the certificate technology last week. The certificates were developed by Digital Signature Trust LLC, a Salt Lake City-based vendor that was acquired by Identrus early this month.

Alan Thornton, a staff engineer at Entergy Corp., said the New Orleans-based company will begin its migration to the Identrus certificates this week. Entergy will require all trading partners that want to use its transmission lines to conform to the new standards by the end of June, he added.

Ultimately Easier to Use

"While it will require some change, we think [the Identrus technology] will ultimately be easier to use and provide better security," Thornton said.

Currently, authentication software must be loaded onto individual workstations, Thornton said. The new technology provides Web browser links to Identrus' public-key infrastructure systems.

Other users that are preparing to implement the certificates include Columbus, Ohio-based American Electric Power Co. and UBS Warburg Energy, which earlier this year acquired Enron Corp.'s online energy trading business. UBS Warburg Energy and Enron are both based in Houston.

Alan Davidson, director of energy services at Digital Signature, said the certificates require the use of digital signatures that conform to proposed standards recently submitted to the World Wide Web Consortium (W3C) and the Internet Engineering Task Force (IETF).

The certificates will be assigned to employees of energy trading companies for $175 each and will be valid for one year, Davidson said. When trades are made, the trading systems will check an Identrus database to verify that the parties are certified.

Identrus said the new certificates also comply with draft authentication procedures that were developed by a working group within the North American Energy and Reliability Council, a Princeton, N.J.-based organization that sets standard trading practices for the energy industry.

Tom Smedinghoff, a partner at Baker & McKenzie, a law firm in Chicago, said government regulations and vertical industry standards are ultimately what will drive digital signature adoption. But simplicity will be a key incentive to potential users, he added.

"I've been involved with limited digital signatures initiatives in the pharmaceutical and financial industries, and the technology complexity and the legal complexity is sometimes formidable," he said.

The federal government approved the use of digital signatures in business transactions two years ago. But the technology needed to support them wasn't in place, said Joseph Reagle, co-chairman of the joint W3C/IETF working group that published its draft XML-based standards in February.

"We had to figure how to assign parts of XML documents while making sure we didn't compromise the data integrity," he said. "That took a significant amount of work." ◗

Federal Sign-Off

The earliest adopter of digital signatures has been the U.S. government. Here are some areas where it's using digital signatures:

- **W3 employer wage report filings to the Social Security Administration**
- **University grant applications to the National Institutes of Health**
- **The Food and Drug Administration gateway that standardizes data transmissions among the FDA, the pharmaceutical industry and other regulators**

Valentine: Microsoft Is Starting Second Round of Security Training for Its Workers

Brian Valentine, senior vice president of Microsoft Corp.'s Windows division, spoke earlier this month with *Computerworld*'s Carol Sliwa about the progress the software vendor has made on its Trustworthy Computing security initiative.

Can you provide an update on what has happened so far? First, it was mandatory training during the month of January for every Windows engineer, actually every Windows employee. . . . We've trained almost 10,000 people now inside of Microsoft. . . . Through the Windows process, we did 8,000.

Can you describe the training? It's a full day, pretty intensive training session. . . . There's a section on simple coding mistakes and how not to make them. . . . Then there's a whole [section on] complex coding mistakes, which really go back to design issues. . . . Another one is how to change the engineering process to actually design for security upfront and then manage to security as you develop your products. . . . And then what should testers, the quality folks, think about in doing automated testing and automated things around testing for it.

BRIAN VALENTINE: "There'll be a mandatory day of training from now until probably eternity."

Do you think a single day of training is enough? Absolutely not. That gets you started. . . . Everything we learn and what people discovered in doing that security push that wasn't in the training, we're now going back for a second round of mandatory refresher courses. . . . And then there'll be a mandatory day of training every year from now until probably eternity because the issue doesn't go away.

One of the first major vulnerabilities discovered in Windows XP related to the Universal Plug and Play feature. Do you think that would have happened today? Absolutely not. . . . Fundamentally I'm in a position now to do a couple of things. One is I have a trained force of developers, engineers. . . . I also have the capability as a manager of a complex project like Windows that now every single line of code has an owner in Windows, an identified owner, that it was their responsibility during a security push to review that code, review that design.

When do you expect the Windows .Net Server operating system to be released to manufacturing? By the end of the year.

But it's possible that it could slip to next year? Everything's possible. I always live by the Zen attitude of software project management. The ship date was decided thousands of years ago. We just have to discover it.

What kind of product delays will people likely see as a result of the security initiative? It took nearly 10 weeks for us to go through that process. . . . I thought that was going to take about four weeks, and we did shut down the machinery. I mean, I literally shut down the Windows machinery. I said, "We will do nothing until this is done."

Windows XP desktop and Windows .Net Server operating systems originally were pegged to ship at the same time. In the future, will the desktop and server operating systems ship at the same time? Our goal is to ship them together. It's very expensive not to.

Why didn't it happen this time? We wanted to be out for Christmas 2001, with a new, exciting operating system. . . . And we made the decision to split the server off because in the enterprise space, they're not cyclical like Christmas and back to school. They might have fiscal years that they buy to, but they're all mixed up across the year. ◗

TALKING ABOUT TRUST

For the complete text of this interview with Microsoft's Valentine, visit our Web site:

QuickLink: 29553
www.computerworld.com

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BRIEFS

Cisco Shows Q3 Profit, Sales Growth

Cisco Systems Inc. reported a net profit of $729 million for its third quarter ended April 27, compared with a $2.7 billion loss in the same period last year. Third-quarter revenue totaled $4.82 billion, up 2% from $4.73 billion a year ago. Cisco CEO John Chambers called the results "a home run" but said the company's order visibility remains limited because of IT spending uncertainties among corporate users.

President, CFO to Leave Commerce One

Pleasanton, Calif.-based Commerce One Inc. said Dennis Jones, its president and chief operating officer, will leave at the end of next month. CEO Mark Hoffman will take back the president's job from Jones, a former FedEx Corp. CIO who joined Commerce One in April last year. The struggling software vendor also said its chief financial officer will step down May 31.

Peregrine CEO, CFO Resign After Audit

San Diego-based Peregrine Systems Inc. announced the resignations of its CEO and chief financial officer after an auditing firm hired last month found potential accounting inaccuracies. Peregrine, which makes asset management software, said the auditor is questioning up to $100 million in sales during the company's past two fiscal years.

Short Takes

LAWSON SOFTWARE INC. in St. Paul, Minn., said results for its fourth quarter will likely be below expectations because of deferred or smaller-than-expected purchases by users. . . . **COMPUWARE CORP.** in Farmington Hills, Mich., reported a $135.9 million loss for its fourth quarter ended March 31, fueled by $429.4 million in charges.

Gartner: IBM Takes Database Market Lead

Informix deal provides boost; report says Microsoft also gained on Oracle last year

BY MARC L. SONGINI

WITH ITS database user group's annual conference on tap in San Diego this week, IBM got some good news to tout: Gartner Inc. said it inched ahead of rival Oracle Corp. in the database market last year.

Stamford, Conn.-based Gartner last week released its worldwide database revenue numbers for 2001, which showed that IBM had $3.1 billion in new license sales vs. Oracle's $2.8 billion (see chart).

IBM's lead was achieved partly as a result of its July acquisition of Informix Corp.'s database operations in Menlo Park, Calif., according to Gartner's report, which was issued by its San Jose-based unit Dataquest Inc. Despite that deal, Oracle retained the top spot in the relational database portion of the market.

But both IBM and Microsoft Corp. saw revenue increases and gained market share at Oracle's expense in the relational segment, as well as in the overall market, noted Gartner analyst Colleen Graham. At the same time, Graham said, Oracle's database sales dropped 5% from 2000 levels.

Betsy Burton, another Gartner analyst, said many users have questioned Oracle's pricing and licensing policies.

"Oracle has a reputation of being costly and very, very tough to negotiate with," Burton said.

IBM's mainframe database business grew 5% last year, Gartner said. In addition, the Informix purchase helped IBM snag new customers for its DB2 relational databases, according to the report.

Oracle's Rebuttal

Meanwhile, Microsoft is exploiting the perception that its SQL Server software is the low-cost database of choice, Graham said. That's "an alluring message to fiscally strapped enterprises," she said.

Oracle struck back against the Gartner report, calling the market share numbers questionable and claiming that IBM's and Microsoft's revenue totals should be validated by an independent auditor.

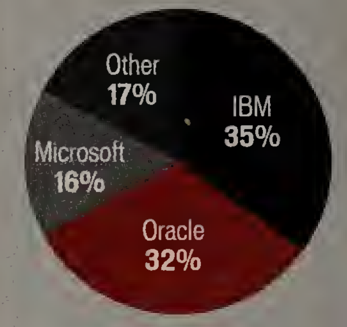
Rene Bonvanie, vice president of Oracle9i database marketing, said Oracle saw "phenomenal growth" in database sales before the dot-com crash and the economic slowdown. In turn, he noted, it was the first vendor to feel the pinch when IT budgets shrank. But he said Oracle has strategies to help it recover market share, such as a sales migration program aimed at Informix users.

Michael Schiff, an analyst at Current Analysis Inc. in Sterling, Va., said IBM, Oracle and Microsoft dominate the database market and will fight among themselves for leadership again this year. "The database wars continue, despite the fact that people may claim [to have won] a battle," he said. ◗

James Niccolai of the IDG News Service contributed to this story.

By the Numbers

Database market share totals for 2001, based on new sales of software licenses:



Total worldwide revenue:
$8.84 billion

SOURCE: GARTNER/DATAQUEST, SAN JOSE

Microsoft's Navision Deal Extends Application Reach

Acquisition will add users, broaden product offerings

BY MARC L. SONGINI

Microsoft Corp. last week agreed to buy Denmark-based business software vendor Navision A/S for $1.3 billion, the latest in a series of moves it's making to piece together a full suite of enterprise resource planning and customer relationship management (CRM) applications.

Microsoft said Navision will complement the Fargo, N.D.-based Great Plains Business Solutions unit it acquired in April last year. Although not well known in the U.S., Navision says it has about 130,000 users of its applications, which are aimed at small and midsize companies.

Despite some obvious overlaps in the software lines of Great Plains and Navision, there are no plans to kill any products at this time, said David Thacher, general manager of global CRM at Microsoft. He added that the two application vendors have very different revenue bases geographically: 85% of Great Plains' sales are in North America, while 79% of Navision's business is in Europe.

CRM Market Maneuvers

There will be cross-fertilization of technologies between the two operations, according to Thacher. "We'll be able to scale globally as we build out the next generation of products," he said, adding that Great Plains plans to start work aimed at leveraging Navision's distribution and manufacturing applications as soon as the buyout is completed.

The Navision deal follows Microsoft's February announcement that Great Plains will enter the CRM market later this year. An unresolved issue is how Microsoft's strategy will affect its overall relationship with key application vendors, particularly SAP AG.

"This is the latest salvo in the growing Microsoft and SAP war for the low end [of the applications market]," said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Daly City, Calif.

The previous salvo came from SAP, which said in March that it had purchased the assets of Israeli software vendor Top-Manage Financial Solutions Ltd. as part of a plan to roll out a set of applications for small and midsize businesses.

Henning Kagermann, SAP's co-chairman and CEO, said in a statement that the firm's relationship with Microsoft "is typical of business today, with companies partnering in certain areas while they compete in other areas." Thacher made similar comments for Microsoft. ◗

AT A GLANCE

Navision A/S

HEADQUARTERS: Vedbaek, Denmark

PRIMARY PRODUCT: Business applications for use by small and midsize companies

REVENUE: $46M in Q3, ended March 31

EMPLOYEES: 1,300

NUMBER OF USERS: 130,000

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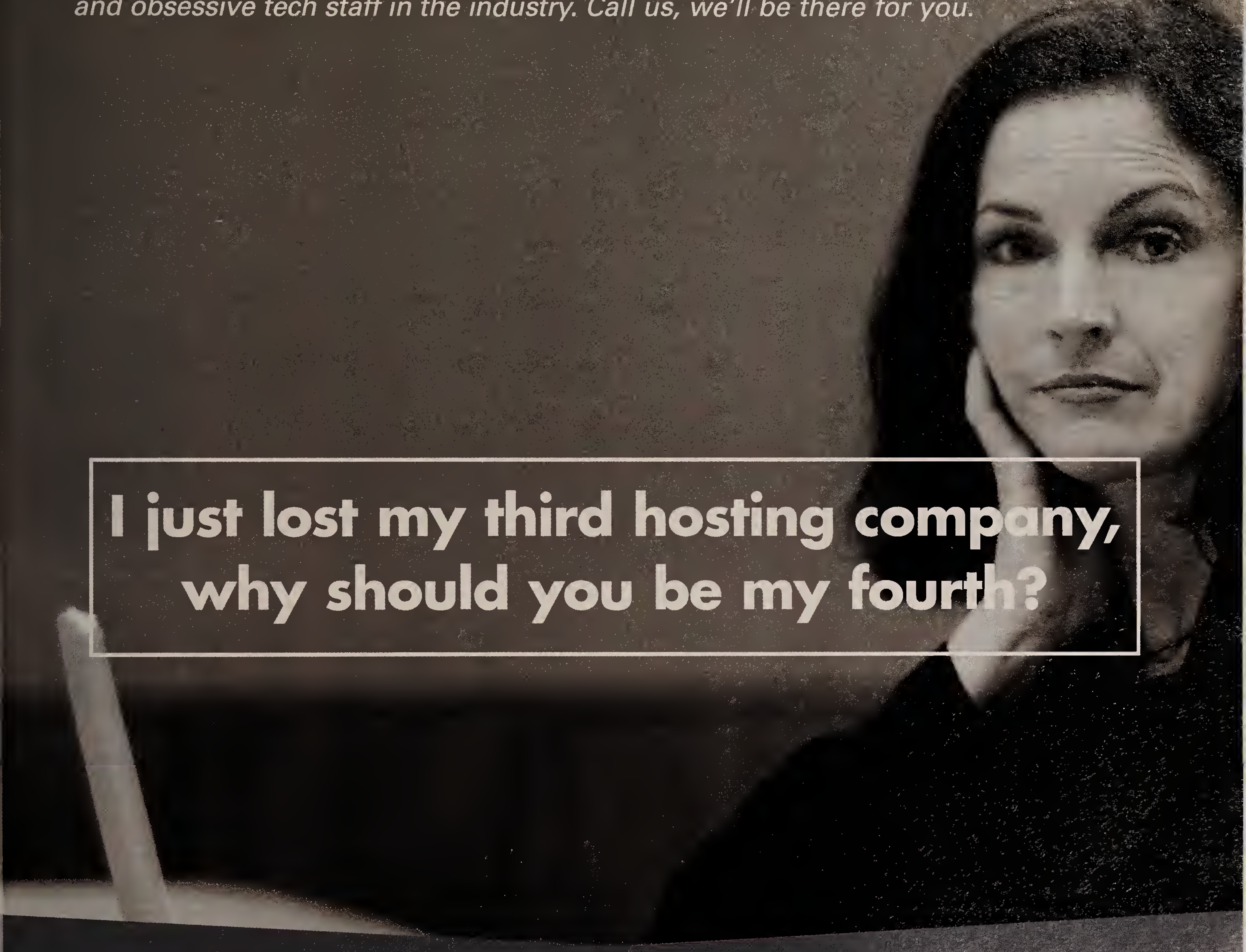
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PATRICIA KEEFE

The Big Secret

MOST CONVERSATIONS about the state of IT unemployment sooner or later get around to the Big Secret, the one thing everyone wants to know and most pundits dance around: What are the hot skills required to land a job today? What is it exactly that the American IT workforce is missing?

PATRICIA KEEFE is editorial director at *Computerworld*. You can contact her at patricia_keefe@computerworld.com.

We ran into that stonewall repeatedly while researching our April 29 special report on the causes behind the depressed IT job market [QuickLink: 29295]. Last week, the Information Technology Association of America (ITAA), a vendor trade group, announced some cheerful news: IT jobs are coming back! "The future of the IT worker is still bright," the group said, despite the massive layoffs of last year and this year's continuing recession.

Indeed, the ITAA's new survey of 523 hiring managers indicates that U.S. companies will seek to fill as many as 1.1 million high-tech jobs in the next 12 months (see story, page 18). Sounds great. And I hope that's true, but based on the extensive research we did over the past month, I seriously doubt the ITAA's conclusions — at least as far as the next six months are concerned.

First, the ITAA's projections on new hires work out to be only slightly more than were laid off last year, given their caveat of a so-called skills imbalance, which I'll discuss further below. Second, IBM last week warned employees that it might have to cut jobs because customers aren't buying as much technology as they did in the past decade. IBM CEO Sam Palmisano said he expects the technology sector to remain below historical growth rates this year *and next*.

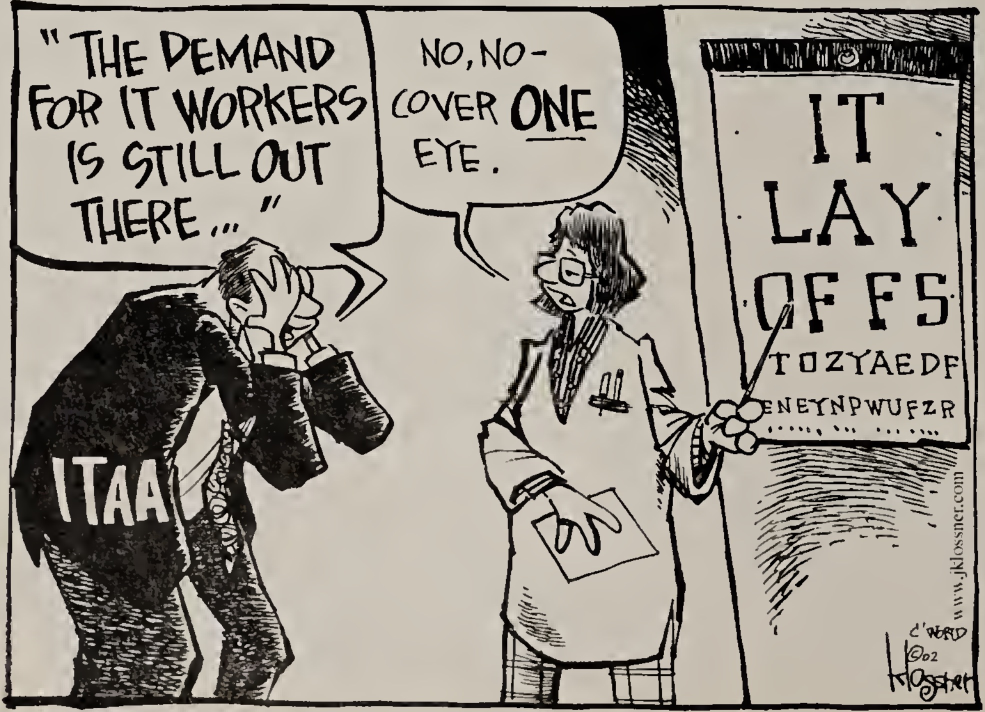
Third, a smattering of new reports cite "cautious optimism" among employers, but very little in the way of concrete plans to add jobs or look for new hires. Finally, toss in the continued and growing interest in outsourcing — not just here, but also abroad. The ITAA study found interest in "IT outsourcing as a coping strategy" up 17%.

The ITAA, meanwhile, undercut its own good news by predicting that more than half of these new jobs will go unfilled due to a "skills imbalance," which, by the way, is what employers and proponents say is the driving force behind H-1B hires. But most high-tech H-1B visa holders are hired to fill engineering, systems analyst or programming jobs. And programmers, followed by engineers, comprise the largest sector of the U.S. IT workforce. So there is a disconnect here that needs further explanation.

It's just not enough to say we aren't graduating people with the right skills, and babble about changes to the educational system. We have masses of experienced, unemployed people looking for work right now. Many of these laid-off IT workers are actively seeking to expand their skills and could sure use some direction.

The ITAA has teamed with Dice Inc. to create a Tech Skills Profile that it says will highlight the skills most in-demand today. Currently, they say these are in C++, Oracle, SQL, Java and Windows NT.

These aren't exactly spanking-new technologies, so you'd think there'd be a match with many of our IT unemployed. In any case, now is the time to brush up your skills, since multiple reports point to late 2002 as the point at which we will start to see improvement in the IT job market. Hopefully, more specifics will be forthcoming as to what skills U.S. IT workers need to add to their repertoire. The industry and employers owe these workers an answer. ◗



PIMM FOX

A Lesson in Managing Vendors

VENDOR management is undergoing a change, and Canada's oldest and largest retailer, Hudson's Bay Co., is pioneering the way.

PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

The Toronto-based company told vendors it wanted to use IT systems to build a new bond with its customers and it wanted vendor cooperation, not competition, to help it reach its goal.

David F. Poirier, executive vice president and CIO at Hudson's Bay, said the new approach for Oracle, Microsoft and IBM meant not only selling products and services to Hudson's Bay, but also getting them to be part of the retailer's transformation. "We made sure they knew their participation was to ensure our success," he said.

In essence, Poirier put the vendors in a room together, established a program office and forged a plan, with vendor participation, to realize Hudson's Bay's goals, rather than debate vendors' strengths.

This was crucial because after laying out the overall IT strategy, Poirier realized it would take five to seven years to complete. "But we just didn't have that kind of time," he said. "We needed to get it done in three to four years and looked to the strategic vendor alliances to make it happen."

Poirier wanted to combine the back-office operations of Hudson's Bay's four customer channels — Zellers, The Bay, Home Outfitters and HBC.com — and then tie them to the Web front end.

By creating a strategic alliance of vendors, Hudson's Bay cut time and money out of negotiating sessions and reduced mistrust among them. One example of the company's success is getting IBM and Oracle to work together

For more columnists and links to archives of previous columns, go to www.computerworld.com/columns

for the deployment of Retek 10, a retail-specific application from Retek Inc. in Minneapolis.

Instead of spending money and time on lengthy contract wrangling, the IT staff got to work quicker and implemented projects faster. As a result, they have completed the financial system, a customer data warehouse, the dot-com business and the system for a loyalty program. Supply chain is next.

Right now, customer orders from the dot-com operation go through a central fulfillment warehouse and then a warehouse management system that feeds into an Oracle database tied to the credit card system.

Replacing client/server-based operations with a new Oracle-based application that moved staff expense reporting online decreased reimbursement time by 80%, from 21 days to three.

"The entire amount of time to review and purchase financial systems was six weeks," said Poirier, "Three years ago, we bought a similar credit system and it took us 18 months."

Hudson's Bay learned that when vendors commit to a project rather than a sale, their success is directly tied to its own. ◗

DAVID MOSCHELLA

Ebbers' Exit The Latest Telecom Woe

BERNIE EBBERS' departure from WorldCom marks one of the more visible milestones in the extraordinary collapse of the global telecommunications industry.

A decade ago, who would have thought that this once stodgy and heavily regulated sector would become the biggest business financial disaster since the savings and loan crisis of the late 1980s? By some estimates, more than a trillion dollars in paper value in the telecommunications sector has vanished over the past few years.

Changes of this magnitude can always be viewed in many ways. In this case, there have been such issues as regulated vs. unregulated businesses, new vs. established competitors, voice vs. data transmission, and high vs. low bandwidth. But my favorite way of explaining this particular debacle is to see it as a classic case of a misapplied metaphor. Indeed, the false but pervasive analogy between communications bandwidth and microprocessor power is perhaps the single biggest reason why so much of the telecommunications industry is on the brink of bankruptcy.

DAVID MOSCHELLA is an author and independent consultant. Contact him at **dmoschella@earthlink.net.**

From the beginning of the Internet boom, many industry leaders and pundits have continually made the point that, just as ever-improving microprocessor power drove the PC industry, rapid increases in communications bandwidth would drive the Internet boom. This observation, of course, was not without merit; bandwidth has clearly been an important Internet industry factor. But the comparison to microprocessors was only half right. The more accurate parallel was with a different kind of semiconductor — memory chips.

The failure to recognize what might seem to be a minor distinction can explain much of what has subsequently occurred. The analogy to microprocessors made it easy for telecom enthusiasts to leap to the conclusion that the leading purveyors of bandwidth were destined to become the Intels of the 21st century. Much of the telecom stock boom was premised on the idea that a new set of high-growth vendors with sustainable and near-monopoly market power — and correspondingly high profits and stock valuations — was about to be created. Who wouldn't want to invest in that?

But investing in companies that make memory chips has always been a much more risky proposition. Like microprocessors, memory chips require huge capital investments and rapid price/performance improvements. But unlike microprocessors, memory chips are a brutally competitive business and subject to massive cycles of boom and bust. Whereas Intel has dominated the microprocessor business for more than 20 years, the commodity memory chip business has featured an ever-changing cast of international suppliers. Few industries have seen such ongoing and tumultuous supplier change.

Over the past decade, the global telecommunications business has been on a similar roller coaster, and given the sector's excess capacity, heavy debts and low stock valuations, many further shifts are likely. No supplier is likely to sustain a dominant position in providing transmission services, which are increasingly becoming a commodity market. And even in the local loop, cable modems, DSL and high-speed wireless services promise fierce competition ahead.

Thus, instead of becoming a new generation of Intels, telecom vendors may well come and go the way of Micron, Samsung, Toshiba and other memory suppliers. Given how important network service providers are to many organizations, this is certainly unfortunate. But it's just one more thing that IT professionals will have to get used to. ◗

READERS' LETTERS

Gates on the Stand

FRANK HAYES' column "That's Incredible" was as incredible as its title [QuickLink: 29256]. Did he read Bill Gates' written testimony or only the oral testimony? For accuracy, Hayes should have mentioned that the oral testimony was based solely on prosecution questions that were a deliberate attempt to make Gates look bad. The states' proposal is riddled with errors and bad economic policy. If adopted, it would be doomsday for Microsoft and its customers. Imagine four competing, fragmented versions of Office that sell for $2 each with no revenue available for new investment in development. Imagine that the U.S. lost its leading software product to foreign companies.

Lewis Stepp
Owner
The Craftsman Gallery
Cincinnati

I DON'T RECALL anyone from my state asking me what I wanted in my operating system of choice [QuickLink: 29289]. If I can't get as much as possible for a single price, then perhaps McDonald's will offer hamburgers with options like bun, mustard, ketchup, pickle, meat and wrapper.

Joe Gott
Yucaipa, Calif.

REMEMBER the scene in *Blazing Saddles* where Cleavon Little puts a gun to his head and holds himself hostage to escape an angry mob? It's almost like Bill Gates was watching this movie the day before his testimony. It would take one dumb judge to think that any company would pull its most critical and profitable product off the shelves for 10 years. An empty threat? I think so. Just as Little was in an absurdist situation where the consequences of his threat were the same as what the crowd wanted, Microsoft's threat couldn't be more pleasing to those who want its behavior curbed.

Carl E. Beehler
Media, Pa.

Funny Numbers

THE ITAA, a consortium dominated by large vendors, was founded to open the U.S. to foreign competition — free trade in programmers [QuickLink: 29295]. Its method was to develop bogus industry employment data. Armed with false data, it lobbied to invite up to 600,000 programmers to the U.S. It realized its wish for cheap labor, but it got some unintended consequences: lower sales (workers cost little, so there's less need for labor-saving systems); bankruptcy filings; future shortages (smart people aren't training for technical careers); a difficult labor pool (ads stress good communications skills, meaning English speakers); bitterness toward government (once again, Congress sold its votes to the detriment of its constituents); hostility toward employers (nothing more needs to be said on this point).

Karl B. Keller
Westlake Village, Calif.

YOUR APRIL 29 article on the H-1B visa controversy egregiously misquoted me [QuickLink: 29290]. My research found that among computer-related H-1Bs, only 1% have Ph.D.s. Your story omitted the qualifier *computer-related* and stated that my findings were contradicted by the INS statistic of 8.1%. The INS research actually confirmed mine, with the INS finding that only 1.6% of the computer-related H-1Bs had Ph.D.s.

Norman Matloff
Professor of computer science
University of California, Davis

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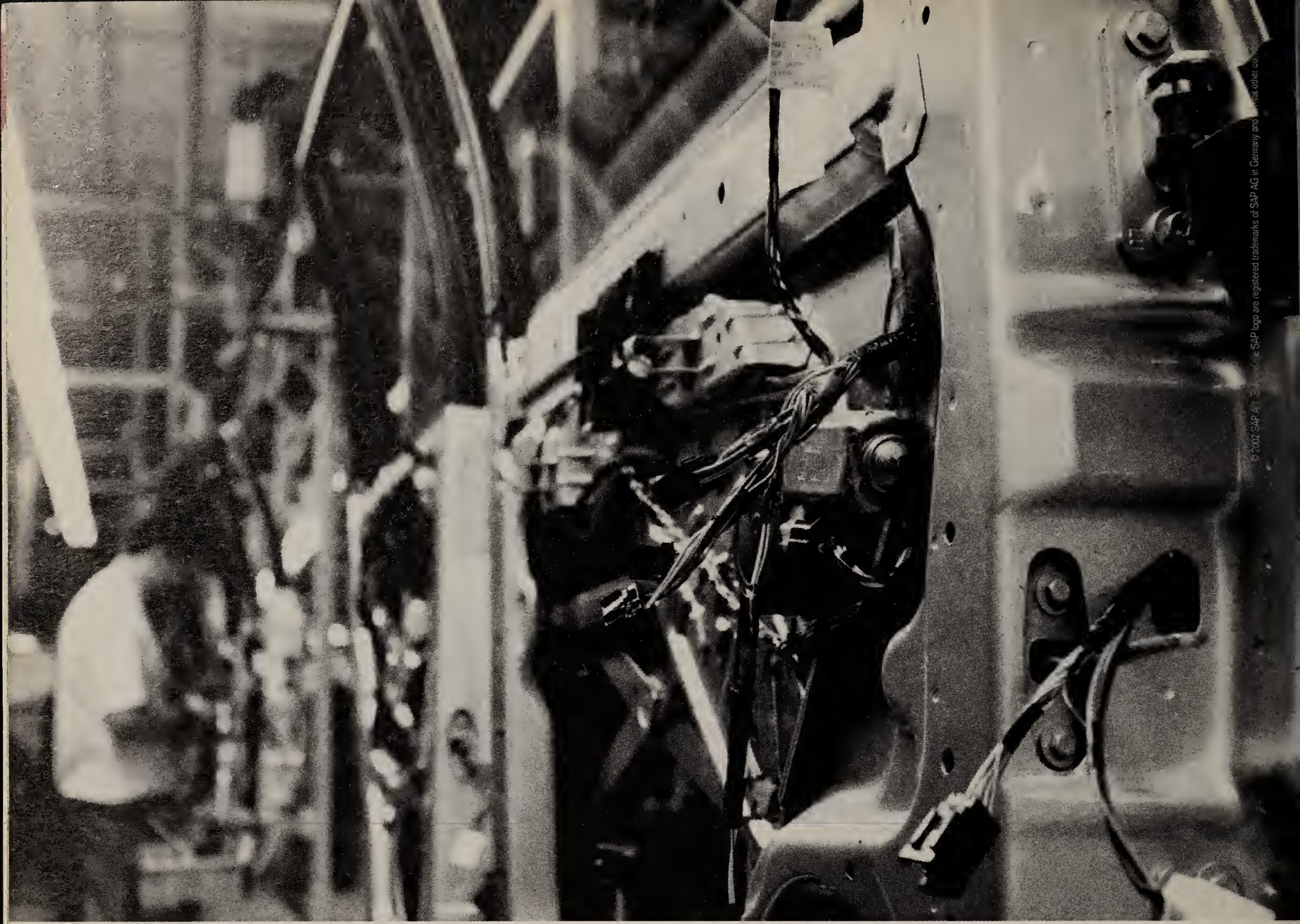

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THIS WEEK

FUZZY MATH

Board-level executives are demanding tangible evidence that IT projects are going to generate payback. But as many IT managers have discovered, the ROI on projects often can't be measured easily — if at all. **PAGE 36**

ROI CHEAT SHEET

Here's a rundown of the most popular metrics used by business executives to measure the returns on IT projects, along with the pros and cons of each approach. **PAGE 40**

MODERN MIDDLEMEN

Unlike many of their predecessors who fell victim to widespread layoffs in the early '90s, today's IT middle managers are validating their worth by bridging the vision of senior management with the work that's carried out by the rank and file. **PAGE 44**

BIG IRON BOUNTY

IT managers are discovering that it's cheaper to run Linux applications on mainframes than across clusters of Intel servers. **PAGE 47**

BART PERKINS

More Isn't Better

IF YOU OWN TOO MANY PRODUCTS from too many suppliers (who are chasing too many buyers), it's likely that you're absorbing some needless costs. A typical Fortune 500 company can easily spend 10% to 15% beyond what it really needs in IT products and services.

One of my clients, with an annual IT budget of $250 million, used to spend $150 million on suppliers. That was reduced by $19 million, or more than 12%, through a supplier portfolio management program, cutting the overall IT budget more than 7%.

In 1985, managing suppliers was simpler. Most companies relied on only two or three critical vendors: IBM, AT&T and a minicomputer manufacturer. As technology options emerged, companies rushed to experiment with hundreds of IT products. Today, the average Fortune 500 company buys from as many as 10,000 suppliers, 30 to 40 of them critical. Many companies underestimate the number of suppliers in their portfolios. For instance, a pharmaceutical company recently reviewed its portfolio and found 30,000 domestic IT suppliers — 22,000 more than it originally estimated.

The number of technology buyers has also escalated. In recent years, the average Fortune 500 company might have allowed 100 people to buy IT products and services. Today, the same company may have more than 400 staffers involved in buying, many of them outside the IT organization. What happens when you allow hundreds of buyers to make thousands of uncoordinated buying decisions? You get an overly complex portfolio that makes architectural goals almost impossible to achieve.

Having a large portfolio is expensive. Uncoordinated buying decisions make it difficult to achieve economies of scale, and costs can soar in the following areas:

- **Procurement.** Selection, negotiation, contracting and fulfillment are time-consuming and expensive.
- **Relationship management.** Performance measurement and ongoing communications with suppliers require significant staff time.
- **Product integration.** The more products you have, the more time you must spend making them work together.
- **Support.** Each product must be installed, upgraded and maintained. Users and technical staff must be trained.
- **Accounts payable.** It's surprisingly expensive to pay an invoice. The invoice must be validated to ensure that all of the products have been received, discounts and allowances taken, and outstanding credits from prior payments applied. With all those steps, a typical large company spends $30 to pay each bill.

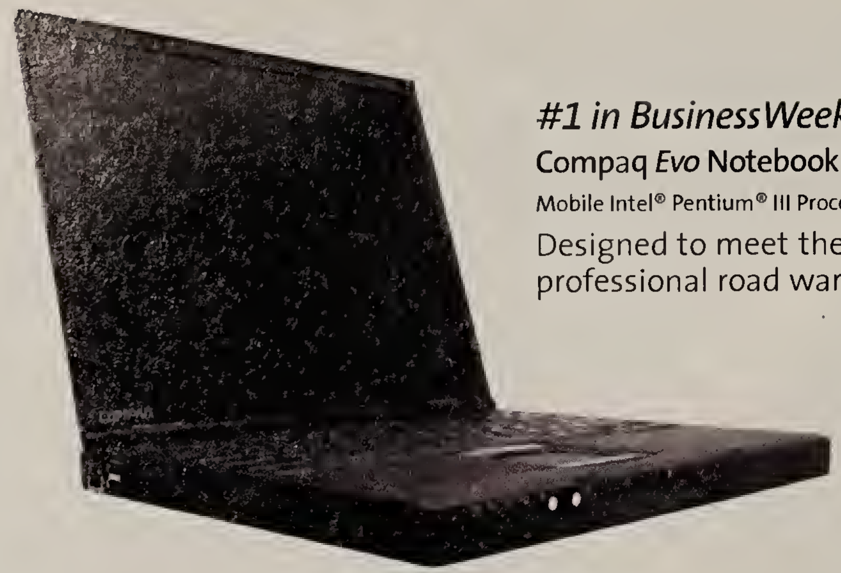
Since these costs are incurred with each supplier, you'll reap significant savings with every supplier you eliminate. Be rigorous, but don't be so zealous that you kill all technical experimentation.

Here are some specific steps to begin creating a supplier portfolio management program:

- **Create a baseline inventory of all IT suppliers.** Indicate how much you pay each of them annually and the products and services each provides. Remember to count the "invisible invaders" — suppliers whose products are buried in equipment, or those you inherit when a supplier merges with or is acquired by another company.
- **Develop a sourcing strategy.** Analyze your supplier portfolio for compliance with your IT architecture, along with product gaps and overlaps. Select a primary and secondary supplier for each architectural component, and devise plans to eliminate the others. Then, renegotiate more favorable contract terms with your primary suppliers in exchange for giving them more business.
- **Develop standards** to match buying decisions with your architecture and guide procurement personnel. If you don't, you're opening the door to technological chaos.
- **Standardize the buying process** to coordinate enterprisewide buying decisions.
- **Manage the suppliers.** After the purchase, actively manage your suppliers to make sure you get what you're paying for.

Most corporations simply negotiate one deal after another in isolated buying decisions. This approach misses the leverage you can achieve by managing your suppliers collectively in a streamlined portfolio. An effective supplier portfolio management program will result in fewer buyers and suppliers, and far less cost. ◗

BART PERKINS, a former CIO at Tricon Global Restaurants Inc. and Dole Food Co., is managing partner at Leverage Partners Inc. in Louisville, Ky., which helps CIOs manage their IT suppliers. Contact him at **BartPerkins@LeveragePartners.com.**



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THE Fuzzier SIDE OF ROI

Top executives want hard proof that IT investments will help the bottom line, but practitioners warn that an overly strict ROI mandate could jeopardize important technology deployments. **BY DAVID JOACHIM**

DON'T BE FOOLED by CIOs who claim that every IT project needs to pass a rigorous ROI test. They don't really believe it. They're just saying that to satisfy their bosses, who are under intense pressure to justify every dollar spent with at least one dollar returned.

IT executives working through this economic slump find themselves in a precarious position. CEOs, chief financial officers and shareholders have become hard-liners when it comes to technology ROI. In part, it's a backlash from the free-spending ways of the dot-com boom. Now they want proof that every IT investment pays back in some tangible way — no excuses.

But taking an accountant's view of IT priorities could actually be counterproductive, because a spreadsheet doesn't tell the whole story. In fact, some of the IT projects that impact business the most can't be measured easily, if at all, some experts now say.

"The boldest strokes I've seen in IT haven't had to go through these ROI tests," says Bob Reeder, CIO at Alaska Airlines Inc. He points to advancements such as General Motors Corp.'s OnStar road navigation system, which ushered in new levels of customer service and therefore doesn't fit neatly into traditional models for calculating ROI, he says.

If Seattle-based Alaska Airlines had ranked its IT priorities based purely on strict ROI metrics, it might not have started selling tickets online in 1995 or added check-in kiosks at airports in 1997 — two projects that have produced positive results, Reeder says.

Basing IT priorities on ROI rankings is a fool's game, Reeder says, largely because of the way so many ROI metrics are calculated. Under pressure to produce quantitative forecasts, project leaders have learned how to be creative with numbers.

"It's like the biggest liar wins," Reeder says.

While CIOs say the payback on most IT projects can be measured in dollars, many utilitarian but necessary efforts, like infrastructure upgrades and installing and supporting collaborative applications, can't be, and those projects are getting short shrift these days.

Indeed, ROI has a softer side that's too often ignored. This aspect of ROI helps explain why collaborative applications and IT projects that help improve product quality or customer service sometimes get the green light, despite their questionable short-term impact on the bottom line.

"There are soft benefits to every investment, in addition to the hard-dollar benefits," says John Berry, an independent management consultant in Bend, Ore., who specializes in assessing payback on software. Some projects produce qualitative results that are meaningful but difficult to trace back to the initial technology investment, he says.

"E-learning is supposed to create a smarter organization. How do you measure smarter?" Berry asks. And even if you could measure the collective intelligence of your staff, you couldn't necessarily attribute any intellectual gains to new technology.

Risk Ready

Between the hard and soft ROI measurement extremes, some see a middle ground. Increasingly, IT shops are employing methodologies designed to gauge the impact of an IT project, even if the measure is soft. The most popular of these is risk assessment, which uses so-called filters to gauge the likely outcomes of an IT deployment.

On the negative side, a risk assessment may tell you that deploying SAP AG's enterprise resource planning (ERP) software will force workers to change the way they process invoices, thereby delaying some of the anticipated ROI from such a project, says John Berry, an independent management consultant in Bend, Ore. On the positive side, a risk assessment may tell you that deploying the ERP software will help you beat your competitors to the punch and serve customers better than they can.

Bernice Dixon, CIO for corporate operations at Lexington, Mass.-based Raytheon Co., says risk assessments can fill the void when hard ROI metrics are elusive. "Analyzing your network traffic is hard to justify in ROI terms," she says. "But when you use risk assessment as a tool, you can justify it because of the risk of losing your proprietary data outside the network."

– David Joachim

It's particularly tricky to calculate the benefits of infrastructure improvements. Upgrades to servers, networking equipment and operating software contribute to the success of every application they touch, yet it's nearly impossible to know whether an application does more for the business if, say, it's aided by more bandwidth.

Those who try to apply ROI figures to infrastructure investments miss the point, says Victor Votsch, an analyst at V-Square Solutions, a Narberth, Pa.-based consultancy. "Do you [measure] ROI on your phone system?" he points out. "With infrastructure, you're preparing for change. You know change is a constant, but you're not sure what it will be."

Creative Calculations

Some IT shops, nonetheless, are able to find creative ways to quantify benefits that are largely qualitative. Cisco Systems Inc., for example, has been known to place a dollar value on customer satisfaction, based on the presumption that satisfaction leads to more sales.

But some analysts advise against this practice. If you can't trace a customer's satisfaction directly to a new sale, or a reduction in labor directly to a cut in head count, don't credit the technology for the ROI, says Rebecca Wettemann, an analyst at Nucleus Research Inc., a technology ROI consultancy in Wellesley, Mass.

IT shops are particularly creative when it comes to measuring the results of process improvements. If an application is deployed to automate expense reporting, a company might count the number of hours managers used to spend on their reports and multiply that number by the average hourly salary of those employees. That would likely produce a hefty ROI figure.

However, you don't necessarily get an hour of productivity back for every hour of labor you save, Wettemann says. In practice, managers and executive-level workers tend not to give all of their saved time back to the company. Instead, they may use the found time to check their stock portfolios online or make personal calls. So in this case, Wettemann might apply a "correction coefficient" to her ROI analysis that says the company will get only 30 minutes back for every hour of labor each executive saves, she says.

Reeder doesn't even try to calculate such gains. "A lot of people are kidding themselves that they can really quantify ROI on something as soft as productivity improvements that don't lead to lower head count," he insists. He calls such attempts to measure productivity gains "fun with numbers."

At GM, most IT projects produce calculable results, says Chief Technology Officer Tony Scott. For those that don't, particularly those projects that generate long-term but not short-term results, GM's IT department makes an extra effort to align with business managers in the regional or operational units affected by the project, Scott says.

The four regional CIOs at GM are closely aligned with their respective chief operating officers, in effect giving the CIOs responsibility over profit and loss (P&L) for their regions.

"You need a process owner and a P&L owner to say, 'I'm willing to take a bet on this,' " Scott says.

Validation

IT shops that aren't formally aligned with business management should always seek the support of a third party when arguing for a project that will produce soft benefits, Votsch says. These third parties can be independent analysts or consultants. "You need the credibility of a third party who doesn't have the perceived bias that may be there in the IT organization," Votsch says.

Regardless of how you lean on ROI measurements, it's clear that CIOs will continue to push hard for quantifiable metrics and returns.

"The motivation is out there to be as comprehensive as possible, to think of the totality of impact of technology purchases on a company," says Berry. "I believe the CIO when he says he attempts to measure everything. The question is whether he can." ◗

Joachim is a freelance business and technology journalist in Port Jefferson, N.Y. Contact him at djoachim@optonline.net.

JULES FRAZIER

> **The boldest strokes I've seen in IT haven't had to go through these ROI tests.**
>
> BOB REEDER, CIO, ALASKA AIRLINES

A PATH TO MATH

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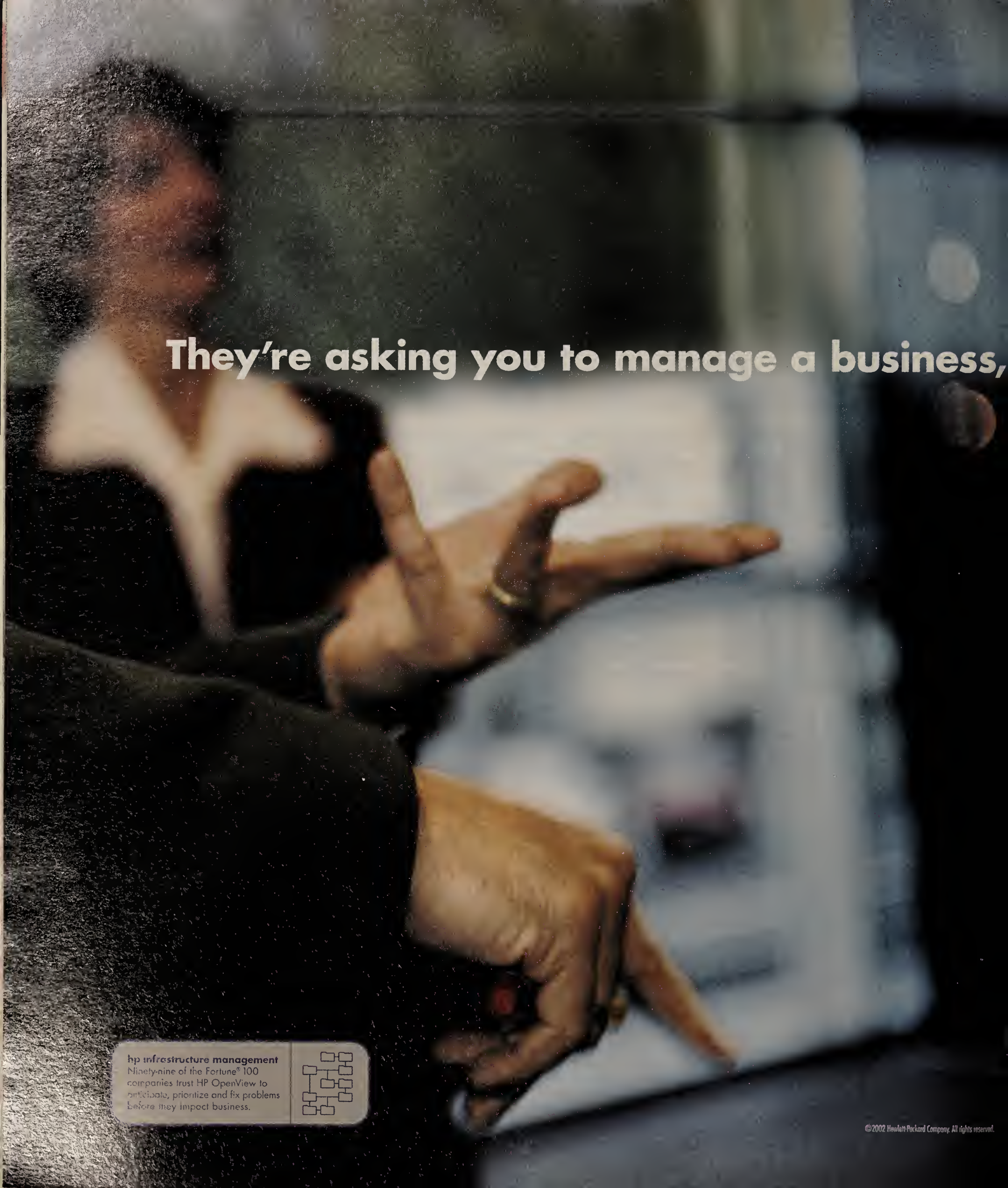
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5 Metrics
FOR THE BOOKS

Here's a cheat sheet of the financial metrics your CFO is most likely using to calculate return on IT investments.

BY JULIA KING

"SHOW ME THE MONEY." That's really what executive purse tenders want when they ask for the ROI on a proposed IT project.

The problem is that most IT managers don't know how to point out the financial potential of an IT project in terms that business managers want to hear or can understand. In a *Computerworld* poll conducted in March of more than 150 senior-level IT executives, two out of three said they lack the knowledge and/or the tools to even compute ROI calculations.

We asked three experts about five ROI metrics that financial and business managers consider basic tools of the trade. The following is a summary of how and when the metrics can be applied to IT projects.

OUR EXPERT SOURCES:
- John Berry, IT management consultant, Bend, Ore.
- John Baldwin, executive vice president, Artemis International, Newport Beach, Calif.
- Bob Fink, business and financial consultant, Westford, Mass.

1

METRIC: RETURN ON INVESTMENT (ROI)

WHAT IT IS: A catchall phrase commonly used for any of several ways to measure the business value of a project. In financial terms, ROI means profit divided by investment, expressed as a percentage. As the numerator, profit can be replaced by cost reductions or productivity gains derived from the operational improvements an IT project yields.
HOW TO CALCULATE: Revenue or cost savings divided by investment.
ADVANTAGE: Best applied to projects where all costs that will be incurred or all cost reductions that will be realized are known ahead of time, usually from experience on a similar project.
DISADVANTAGES: Difficult to apply to entrepreneurial, or "transformative," IT projects that are designed to help launch new products, services or businesses that translate to new sources of revenue and profits. ROI also doesn't consider risk as a factor.

2

METRIC: NET PRESENT VALUE (NPV)

WHAT IT IS: NPV refers to the future net cash flow that a project is expected to deliver, minus the investment. It defines the value of a project in "today's dollars."
HOW TO CALCULATE: Cash inflow minus cash outflows calculated in today's dollars. Example: Kay Carr, CIO at St. Luke's Episcopal Hospital in Houston conducted an NPV analysis in connection with the purchase and implementation of a document imaging and management system. Carr determined cash inflows by calculating what the hospital spends annually on microfilm, records storage, medical records staff and other record management overhead costs, which would all be reduced or eliminated with the new system.
ADVANTAGES: Includes all cash flow related to a project. Considers the time value of money, or the difference in the value of a dollar today and what it might be three years from now.
DISADVANTAGE: The highest NPV doesn't always correspond to the most efficient use of a company's capital.

3

METRIC: INTERNAL RATE OF RETURN (IRR)

WHAT IT IS: One of several metrics that considers the time value of money, IRR expresses the dollar returns expected from a project as an interest rate. Once the rate is established, you can compare it to rates you would earn by investing in other projects.

More informally, IRR is also known as the "hurdle rate" because it's usually the lowest rate of return that management will accept. Typically, a project must earn an IRR that is several percentage points higher than the cost of borrowing, to compensate the company for its risk exposure and time.
HOW TO CALCULATE: Determine all costs associated with the project and call it "C." Estimate all returns that will result from the project and call it "R." Then figure out how many months or years the company will realize returns. Call that "T." Determine your firm's minimum acceptable rate of return, given the risk and the cost of capital.

Now, calculate the interest rate using the formula C=R x T (i). Once you've calculated a factor, reference an NPV chart listing the value of a $1 annuity and find the interest rate that corresponds to your factor based on the number of months or years the project will generate returns. Compare that interest rate to the minimum acceptable rate and determine whether your project will leap over the hurdle rate.
ADVANTAGES: Includes all cash flow related to a project. Considers the time value of money.
DISADVANTAGES: Assumes cash flows are reinvested at the IRR. Cumbersome to calculate interest rate when cash flows vary widely year to year.

4

METRIC: PAYBACK PERIOD

WHAT IT IS: How long it will take an investment to pay for itself.
HOW TO CALCULATE: Initial project investment divided by cash inflows (or cost reductions) per year.
ADVANTAGES: It's simple and understandable.
DISADVANTAGES: It doesn't recognize the time value of money. It also ignores cash or other benefits received after the payback period, which is typically what determines profit.

5

METRIC: ECONOMIC VALUE ADDED (EVA)

WHAT IT IS: Measures a corporation's true economic profit. The idea behind EVA is to understand which business units best leverage their assets to generate returns and maximize shareholder value. Some CFOs are beginning to experiment with applying EVA to individual functions, including IT.
HOW TO CALCULATE: Consulting firm Stern Stewart & Co. in New York (*www.eva.com*) is most often associated with EVA and has developed proprietary methods and metrics for constructing accurate assessments of it.
ADVANTAGE: Precisely defines value in terms specific to an enterprise.
DISADVANTAGES: Complex and not widely used. ◗

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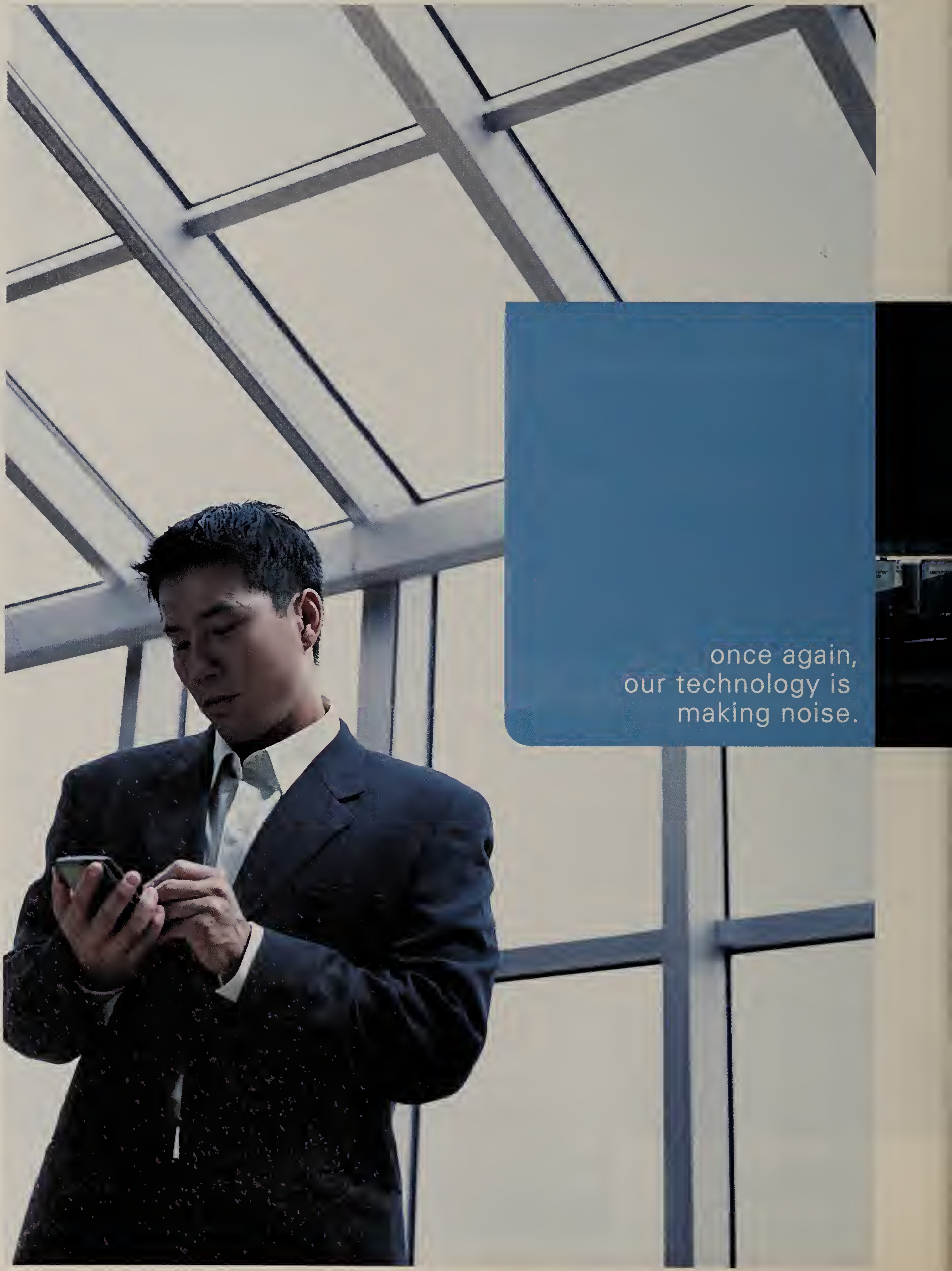

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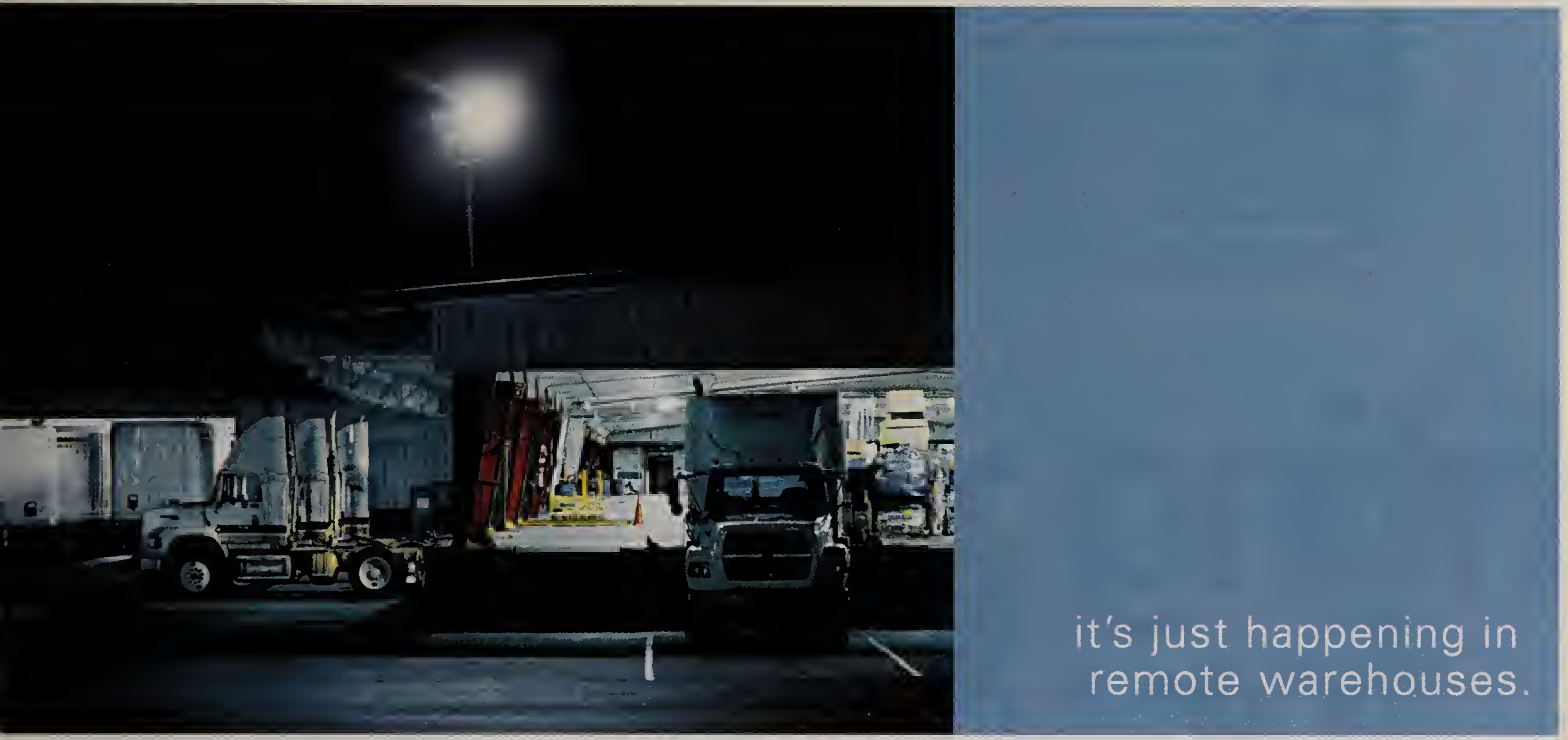

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Fighting for Middle Ground

Unlike their predecessors who suffered mass layoffs a decade ago, today's middle managers play a critical role in bridging technological vision with the work. By Melissa Solomon

MEET WITH VENDORS. Review assignments for the year. Submit service estimate to customer.

Valorie Hartridge, director of marketing systems at Bethesda, Md.-based Marriott International Inc., proudly points out that she crossed that last item off her to-do list just the other day. "I like scratching things off," she says.

But it's not just personal satisfaction that drives her. When asked what's most critical to their survival, middle managers from a variety of companies and industries all agree that while management and technical skills are important, the amount of tangible work they accomplish is directly proportionate to their perceived value by upper management.

"When you get right down to it, it all comes down to delivering," says Bill Stanley, first vice president and manager of technology delivery services at Pittsburgh-based Mellon Financial Corp.

When companies laid off middle managers en masse a decade ago, many bosses saw the middle tier of management as a logical place to cut. Senior managers did the planning, the rank-and-file did the work and middle managers served as an extraneous bureaucratic buffer between the two.

But as technology has evolved into a strategic business tool, companies have found that they need people to connect the dots between the complex visions generated by senior management and the actual execution by IT workers.

"Bottom line: You need to fulfill your commitments," says Bob Marzulli, vice president of IT at New York-based MetLife Inc. But a middle manager can't just do the work, he adds. He needs to be a visionary himself to be able to anticipate future implications for projects and devise plans to tackle them effectively.

Managing Minutiae

Before taking his first management job three years ago, Bic Vogel, manager of Atlanta-based Delta Technology Inc.'s new infrastructure release program questioned the stability of a middle management position. But since then, he has seen how much he can bring to the table. "I think the middle manager stands in a unique position to ... bring technology into the fabric of the business," Vogel says.

Still, the minutiae that goes into that can be overwhelming. Middle managers must communicate with and satisfy their managers, respond to end users and energize and nurture their employees. Then there are budgets, meetings and reports to tend to. They must hire new workers, juggle limited resources, stay on top of ever-evolving technology and anticipate future directions.

How do they do all this? "We extend our hours," says Stanley. "We're in early, we're out late."

But that's a personal choice, says Ann Turnbull, first vice president and manager of distributed architecture and telecommunications at Mellon. Most middle managers have a lot invested in their careers, and they take pride in running healthy organizations and delivering services, she says.

"That's one of the reasons we do the work — the challenge of that balance," she explains. "There's days when you certainly wonder if it will ever end, and there's days when it gets your adrenaline going."

That balance, however, can easily spiral into frustration since middle managers have responsibility for delivering but they don't have ultimate authority over what gets done and how. It can be tough to head down a path, figure everything out and then go to a meeting and learn that the path has been rerouted, says Vogel.

But change is an inevitable part of business, and it's best to ask questions, try to understand the rationale behind changes and then move on, adds Vogel. "I think one of the keys is understanding what the . . . executive level is dealing with," says Vogel. "Change is never well received unless you understand why."

That means middle managers not only have to manage those who report to them, but they also must communicate upward and manage the expectation of senior leaders., says Mike Keslar, who runs the technology delivery division for several lines of business at Mellon. "That's why we're in the middle," he says.

Balancing Act

Another trick is striking a balance between adhering to process and giving workers room for innovation, says Vogel. "The challenge is to deliver effective results in an efficient manner but not to stifle creativity," he says.

The best way to do that is to give workers the big picture, says Vogel. Explain the goals and parameters so they can focus on the destination while shifting the route to best fit their style.

He learned this lesson during one of his first staff meetings, when he formed two teams and asked them to come back to the next meeting with ideas for implementing two pieces of a new project. The teams came back with interesting ideas, but they were completely unaligned and inappropriate for the project's larger goals.

"If you're not clear about what you want done, look out. You never know what you're going to get back," Vogel warns. "Don't just communicate what needs to be done, but the whys."

Being clear about objectives also helps workers buy into a project and keeps them from falling behind, says Stephen Kessler, systems vice president at MetLife. "In a project that's moving fast, people can get lost," says Kessler, who is in charge of building MetLife's new customer relation system.

Marzulli, whom Kessler reports to, says that's one characteristic that makes Kessler so effective at his job. Too often, managers take ownership of projects and delegate tasks to their staffers, who focus solely on those tasks rather than making the end goal their priority. Kessler recalls what motivated him to excel and tries to provide the same motivation for his workers, says Marzulli.

But to keep employees motivated, don't forget about their career development, says Kessler. Be careful to avoid managing too many people. Make sure you're providing clear objectives, feedback and opportunities. And give people a reason to work as hard as you are, he advises.

But middle managers face more challenges than being stuck between workers and executives. Turnbull, who is in charge of Mellon's infrastructure technology, finds that her greatest challenge is juggling the projects of several users with limited resources. To save cash and time, she may take an element from one project, either a process or an actual piece of technology, and use it to meet the needs of other business units, which also helps keep everyone satisfied.

And it's not just a matter of responding to users' requests, says Hartridge. To be an effective middle manager, it's important to talk with customers to find opportunities to help them when they might not recognize those opportunities themselves.

"I'm always listening," she says. "Not so much for the things that are said, but for the potential." ◗

SEEK SKILLS AND BALANCE

Learn firsthand from middle managers about how to develop the skills needed to succeed.
QuickLink: 29330

Read more about steps that middle managers like Delta's Bic Vogel have taken to succeed while achieving some semblance of a work/balance.

QuickLink: 29329
www.computerworld.com

Advice From The Middle

Here are some tips from middle managers about how to do their jobs effectively:

1. **Create clear service-level agreements with users.** Find out what's important to customers in terms of uptime and support.

BILL STANLEY,
MELLON FINANCIAL

2. **Create growth opportunities other than management jobs.** Give employees a range of advancement options.

MIKE KESLAR,
MELLON FINANCIAL

3. **Avoid unnecessary meetings, but when they are essential, separate them into two categories.** The first type is precise: outline objectives ahead of time and check them off as you address them at the meeting. The second type is more conceptual and creative: discuss new ways of doing work and how factors affect people's careers. Let conversations evolve naturally.

BIC VOGEL, DELTA TECHNOLOGY

4. **Create a dual management structure.** Under this scenario, one manager is responsible for career development – hiring and retaining workers within a particular discipline. The other is responsible for project deliverables.

STEPHEN KESSLER,
METLIFE

5. **Provide fair, complete, candid performance evaluations.** Regularly tell your direct reports exactly what they do well or what they need to improve upon. Your strongest employees need feedback or they'll lose their motivation.

BIC VOGEL,
DELTA TECHNOLOGY

6. **Don't cut personal lives off from the job.** Be aware of circumstances that could affect workers' performance and offer to cut them slack before they have to ask for it.

VALORIE HARTRIDGE, MARRIOTT INTERNATIONAL

THINK BIG

There are no small businesses, just small thinkers, says Galactic's IT leader, Anthony Okrongly. **By Kathleen Melymuka**

GALACTIC LTD. isn't a small company, says Anthony Okrongly. It's a huge company in a small package. "Galactic has never seen itself as a small company," he says. "We compete with billion-dollar companies, and we expect ourselves to act like a billion-dollar company — only faster and better."

Okrongly, 32, is vice president of IT at the Arlington, Texas-based purveyor of corporate marketing incentive programs for companies such as Johnson & Johnson and AT&T Wireless Services Inc. Like Galactic, where he started as a receptionist in 1993, Okrongly thinks big. "I never was a receptionist, and I'm not the vice president of IT," he says. "I'm chief operating officer for a Fortune 500 company. I've always seen myself that way. The fact that I have to help build the company to get there is just a detail."

When Okrongly joined Galactic, the business was nine months old and had four employees. He began dabbling with the PCs and eventually became the full-time IT guy, doing network administration and technical support. Okrongly has occasionally taken certification courses, but his expertise comes mostly from experience. In the past, when problems arose, he would call in a vendor the first time, watch and take over from there. "I've grown with the company," he explains. "You just make it up" as you go.

But Okrongly makes it up within the context of a business he understands intimately. "Anthony's been with us since the inception," says CEO Dan Mohorc. "He understands our business and our philosophy and brings IT into what we want to do."

Today, Galactic has about 100 employees, and Okrongly heads a staff of nine. Galactic uses Dell Computer Corp. and Cisco Systems Inc. equipment with clustered servers, storage-area networks and highly redundant switching and Internet access services. It's primarily a Microsoft shop.

For what it might lack in size, Okrongly's team makes up with its technological expertise. "The way we run this company is not small at all," says Gary Cornwell, Galactic's development manager. "We have every tool you could possibly imagine we would need. Our competitors think we're larger than we are because of the services we provide."

Okrongly is trying to add flexibility to his IT workforce by negotiating a partnership with another small company to share some development efforts. Internally, he takes pains to keep the ideas flowing. "I prefer people who complain, because if you're complaining, you're thinking," he says. He encourages challenges from staffers, many of whom come from bigger firms.

"We see things different ways, and there's a little crunch sometimes, but we work it through," says network manager Dave Buchanan.

"Everybody has an idea of how things should be done," Okrongly says. "They challenge what you've done in the past. You've either got to defend it or you change and get better."

REID HORN

WHO: Anthony Okrongly
TITLE: Vice president of IT
COMPANY: Galactic Ltd.
LOCATION: Arlington, Texas
BUSINESS: Purveyor of corporate, noncash marketing incentive programs
2001 REVENUES: Less than $100 million
EMPLOYEES: 100
IT EMPLOYEES: 9

Maximum Support

Okrongly keeps IT visible at Galactic. A few years ago, he was deluged with user support calls. He devised a program offering business end users training videos for the three software programs they used most. Upon completion, they received gift certificates and became eligible for raffle prizes.

In the first year of the program, 60% of the end users became certified, and support calls dropped 90%. The program has expanded to include nontechnical training and cross-training, says Mohorc. "And it will forever be linked with IT," Okrongly adds.

Last year, the IT group developed an internal Web-enabled program called Ideaworks that rewards employees for money-saving ideas. On paper, such programs are complex and time-consuming, Okrongly says, but the Web simplifies administration. Ideaworks saved Galactic more than $1 million last year, raising the profile of IT as cost-cutter. This year, Ideaworks is being sold to other companies, and Galactic expects to see $20 million to $30 million in revenue.

Okrongly acknowledges that he has also had "great failures." A few years ago, he decided to save 40% on local phone calls by changing to an alternate carrier. The changeover failed because the new vendor couldn't provide service in certain areas, and calls were disrupted for weeks. In retrospect, he noticed early signs of trouble: The vendor missed deadlines and didn't communicate well. "Now, if I saw those same bumps in the road, I'd stop the project," he says.

Galactic and Okrongly seem to be on the same wavelength. "I don't set any limits for myself," he says. "When people say to me, 'Isn't it amazing: You used to be the receptionist, and now you're vice president!' I always say, 'Yeah.' But what I'm really thinking is, 'This is just a step along the way.' " ◗

IT LEADERSHIP: THE PEOPLE PART

Galactic's Okrongly gives staffers free rein to take actions – even if he senses they're making mistakes. What do his workers think of this approach?

QuickLink: 28966
www.computerworld.com

TCO: Linux Delivers On Big Iron

Not every company can justify the total cost of ownership of consolidating applications from Intel servers to the mainframe — but those that can save big. **By Mark Hall**

WHEN JOE POOLE LOOKS AT his IBM zSeries mainframe, he doesn't just see a powerful system running traditional corporate workloads. He sees a distributed Linux environment that's starting to save his company big bucks.

"Running Linux on the mainframe is inexpensive," says Poole, manager for technical support at mid-Atlantic retailer Boscov's Department Stores. "We expect to see a two-year payback."

Those types of returns seem to be typical among the adventurous IBM mainframe users who have begun to shift applications from networked Intel Corp. servers to their data center workhorses. And analysts agree that for many companies, Linux on the mainframe can have a lower total cost of ownership (TCO) than supporting applications on hundreds or thousands of distributed servers.

Although hardware and software are an obvious starting point, they're the smallest part of the TCO equation — only 20% to 23%, says David Boyes, chief technology officer at network consultancy Sine Nomine Associates Corp. in Ashburn, Va., who has studied Linux installations on mainframes.

Still, for Poole, hardware and software savings translate to pocketing an extra $100,000 per year that would otherwise have been spent on Intel servers.

So far, Exton, Pa.-based Boscov's is running its Web-based supply chain application and its Novell Inc. NetWare operations using Linux on the mainframe.

The savings Boscov's achieves from not having to buy those Intel servers "means in two years, we'll pay for the $200,000 software license" for IBM's Virtual Machine and Integrated Facility for Linux software, which is necessary for loading Linux on zSeries computers, Poole says.

Winnebago Industries Inc. saw its Linux/mainframe savings come in part from lowering its software licensing fees. Dave Ennen, technical support manager at the Forest City, Iowa-based recreational vehicle manufacturer, says his company bought an e-mail application that runs on the company's mainframe Linux partition and spent a third of what it would have spent for Microsoft Corp.'s Exchange on Intel servers.

Staff Savings

Personnel costs are a much bigger area for savings with Linux on big iron, since it takes fewer support staffers to manage a single mainframe than it does to manage multiple Intel servers. Staffing to support Linux on a mainframe represents 37% to 40% of the TCO, says Boyes.

Today, few mainframe administrators are versed in Linux, and fewer Linux mavens know z/OS, thus creating a skills shortage. But David Mastrobattista, an analyst at Giga Information Group Inc. in Cambridge, Mass., says he isn't worried.

"Linux is an enabling technology to get mainframes back in the politically correct spotlight," Mastrobattista says. He argues that Linux administrators who can be trained on mainframe systems will be attracted to the field and that Linux will be embraced by mainframe administrators seeking new career challenges.

Ennen concurs, noting that his company "has an established discipline managing mainframes" and has only recently entered the Linux world. Still, Winnebago is stoked about the potential there. "We're waiting for the next mission-critical applications to appear on Linux," he says.

The final TCO segment that IT managers need to review, Boyes says, is facilities, which he pegs at 37% to 43% of the total operating cost.

While it's not the first thing people think about, Poole says it's obvious that a network of servers with their attendant switches, routers and hubs eat up much more space and consume far more power than a single mainframe. In fact, he estimates that the annual savings from lower electrical bills will pay for his company's annual Virtual Machine maintenance fee.

Running Linux on a mainframe "cut our electricity bill in half," he says. ◗

TOTAL RECALL

To read other *Computerworld* stories on TCO, go to:

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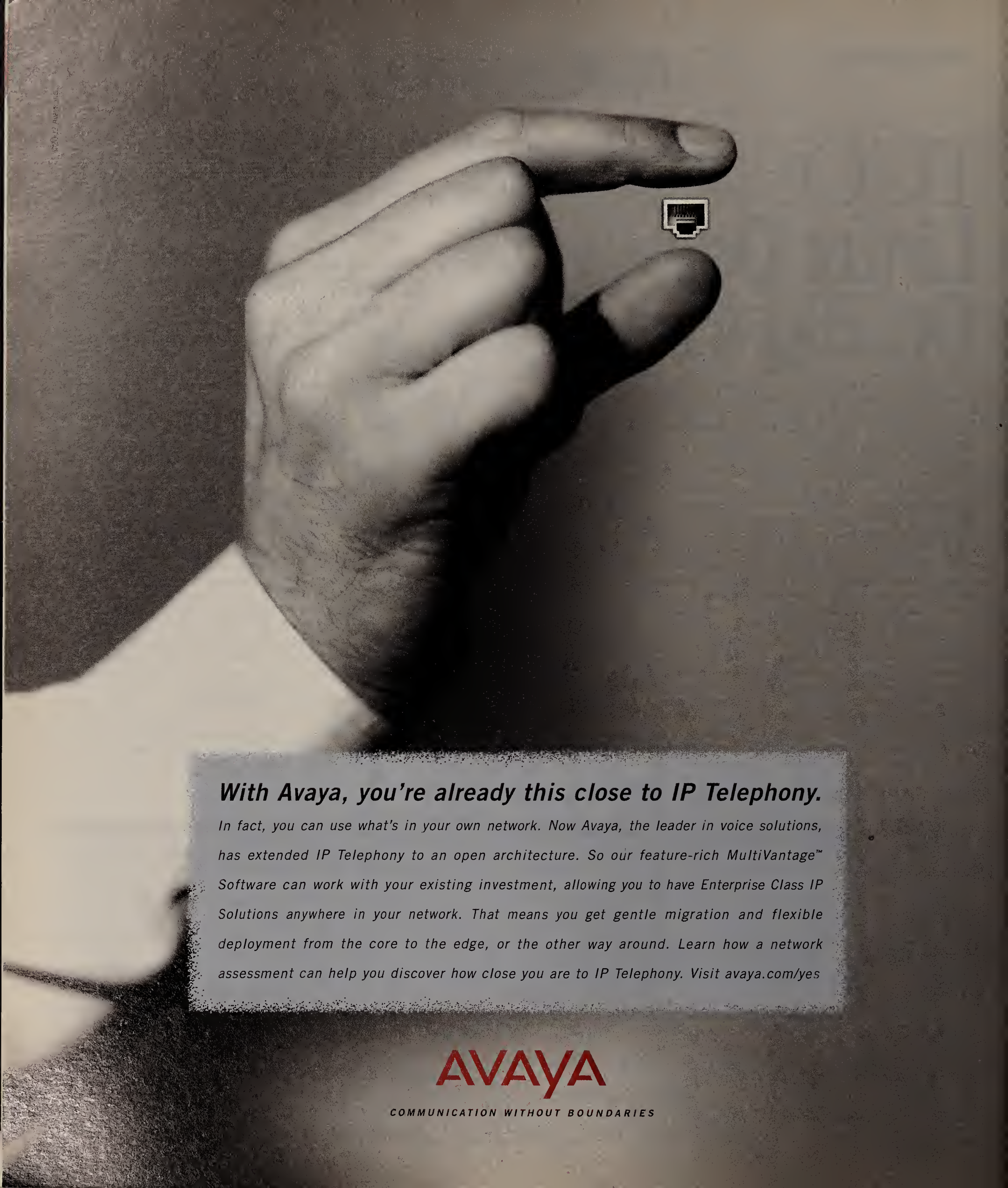
Linux on the Mainframe: Where's the Value?

Savings Area	Pros/Cons	TCO Best Bet
Hardware	■ IBM zSeries mainframe: $250,000 to $400,000 for a single-CPU system ■ Multi-CPU Intel server: $5,000 to $50,000	■ Consolidation of hundreds, or perhaps thousands, of Intel server operations to Linux on a mainframe makes economic sense. Replacing a handful of servers with Linux on a mainframe makes little sense.
Software licensing	■ Windows, NetWare and Unix licenses on individual Intel servers quickly add up. ■ Users of Linux on the mainframe pay for only one license and can have up to 41,000 instances of the operating system running on a single machine. ■ Non-Linux software costs more, too. For example, Microsoft Exchange can cost $75,000 for a single license, while Bynari, an open-source application running on Linux, can cost $25,000 for a single license.	■ When they're available, which isn't that often, Linux and open-source applications generally win big on this issue. Costs can even be lower if you use the open-source software directly instead of licensing it from vendors.
People	■ Mainframe system administrators are relatively rare and expensive.	■ The lack of skilled systems administrators remains a serious challenge for advocates of Linux on the mainframe. But if you have trained staff, you'll need fewer people to run the mainframe than you would for a large network of Intel servers.
Network	■ For a large, distributed network of discrete servers, you need routers, switches and other gear, which add to complexity and cost. ■ Mainframes have fewer interconnect points and products, but those they do have can be pricey.	■ A less-complex network infrastructure can give you more control, better security and manageability. However, you will lack the flexibility to deploy resources to the business as quickly.
Facilities	■ A mainframe takes up less room and uses less electricity than a large network of servers.	■ The mainframe is a clear winner here.



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COMMUNICATION WITHOUT BOUNDARIES

How to Get Your Boss to Listen

Learn to appeal to his decision-making style, according to a Harvard Business Review *writer*

Feel that your boss or colleagues just aren't listening, no matter how skillful your argument? You may be focusing too much on content and not enough on how you deliver your message, writes **Gary A. Williams** *in this month's* Harvard Business Review. *Williams and Robert B. Miller, who are CEO and chairman, respectively, of Miller-Williams Inc., a San Diego-based customer research firm, studied the decision-making styles of more than 1,600 executives and found five distinct types.*

Williams spoke with Computerworld*'s Kathleen Melymuka about how to get through to each of them.*

This is the latest in a series of monthly discussions with authors of articles in the HARVARD BUSINESS REVIEW on topics of interest to IT managers.

Q: What's the No. 1 mistake people make when they try to persuade their boss to do something?

A: One of the most common values we are taught is to treat others as you want to be treated. While this makes sense for society as a whole, it is the No. 1 mistake most people make when trying to persuade their boss. For example, most IT people present their case for projects in the same way they view them — which is probably from a technology viewpoint. The principle that emerges from our research is to change the way you persuade by being adaptive to the receiver's style, not yours.

Q: What types of decision styles have you discovered?

A: The five types are Charismatics, Thinkers, Skeptics, Followers and Controllers. Since we released this study nine months ago, we've found these to be constant in virtually every business culture around the world.

Q: Charismatics sound like the most fun to deal with.

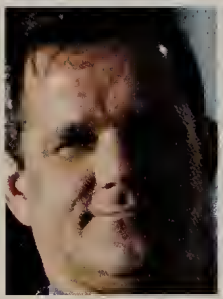
A: Charismatics are the easiest to persuade and, because of their energy, tend to be a joy to deal with.

Q: There must be a catch.

A: The trouble comes in trying to gain their final commitment. They often love the technology and can quickly make the connections to how it will positively impact the business. But they also are notorious for not sweating the details. Instead, Charismatics tend to surround themselves with others who do sweat the details. And that's where the IT projects get shot down.

Q: You say Thinkers are the most difficult to understand. Why?

A: Thinkers are the most balanced in their decision-making and tend to absorb an enormous amount of details. In many respects, they are the perfect match with a Charismatic decision-maker. Thinkers will constantly shift their perspective and often try to persuade themselves for and against a project. A Thinker would examine an IT project from multiple perspectives: technology, user, financial and so on.



THE COMMON value of treating others the way you want to be treated is not a smart practice when trying to persuade your boss, says Gary A. Williams.

Q: What's the best approach to take with them?

A: You need to show that you've examined each perspective thoroughly. First discuss your process of the examination — Thinkers love process — and then discuss your evaluation of each perspective. Be sure to point out where you do or don't have data. It's OK to not have data, but it's not OK to miss a step in the process, like the user or financial perspective.

Q: Skeptics seem like a particularly tough audience.

A: Skeptics operate on personal credibility. If you don't have it with them, find someone else that does and have them present the most critical part of your presentation. Essentially, you are looking for transferred credibility from the other presenter. Over time, you will then gain personal credibility with the Skeptic and be able to present on your own.

Q: How do I hold my ground without alienating a Skeptic?

A: Don't ever try to take on the Skeptic, especially in public. Their personalities force them to want to always be right. The key to not alienating them is to correct their mistakes by giving them credit somehow. For example, "Are you trying to test me? I clearly remember you saying just the opposite in our last meeting."

Q: You say Followers like to think of themselves as Skeptics, but they're not. How can I tell the difference?

A: Followers are the most difficult to recognize, because they often show a variety of types at various times. While Followers and Skeptics both need [you to have] credibility, Followers don't need it to be personal credibility. They will accept another company's success in their evaluation.

Q: Once I recognize a Follower, how do I persuade him?

A: The key here is that, unlike the Charismatic, Thinker and Skeptic, the Follower will rarely, if ever, be an early adopter of technology. They want proof of success, and the more proof the better.

Q: Controllers tend not to listen. That sounds like trouble.

A: You will never win with a Controller, so the best way to deal with them is to not deal with them. Controllers make decisions in a vacuum, although they often force you to generate a lot of activity by asking for data, proof, budgets, etc. Send them the data, but do your best to not schedule a meeting with them.

Q: There must be a way.

A: The only way to win with them is to play the waiting game. Wait for an event outside of their control that will force the Controller to take action — a drop in revenue or a competitor's new product announcement. ▶

DECISION STYLES OF THE FAMOUS

To read about the decision-making styles of industry notables such as Larry Ellison, go to:

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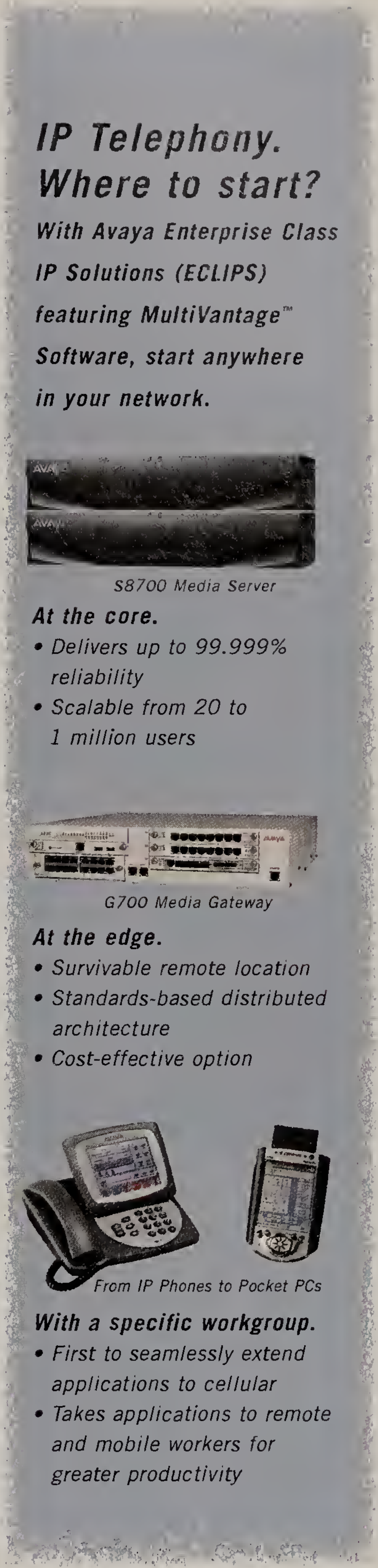

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Dear Career Adviser:

I have a diploma from a technical college with a network integration specialization. I have my A+ and Net+ certifications, and I'm a Microsoft Certified Systems Engineer (MCSE) and a Cisco Certified Network Administrator. After school, I worked in tech support at an Internet service provider. I now work as a software/hardware bench technician on a contract ending this month. Can I improve my chances for a better job by studying for additional certifications? Which are the best ones to go after in this market?

— COMPETITIVELY SPEAKING

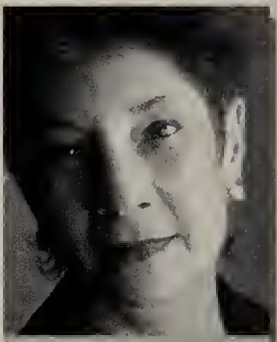
Dear Speaking:

Here are some trends regarding certifications that might interest you, courtesy of David Foote, a *Computerworld* columnist and president and chief research officer of Foote Partners LLC in New Canaan, Conn.: According to Foote Partners' "2002 Technical Skills and Certifications Trend Report," most certifications are company-paid, but more than one-third of trainees pay for their own certifications. And well over half of all workers who attain primary certifications receive a pay raise within the first year.

IT workers with Cisco and MCSE certifications have seen sharp declines in their salaries since 2001, and total compensation for people with networking certifications is definitely cooling. However, networking certifications continue to be a solid course, with base salaries increasing 12.1% in 2001 as bonus pay fell.

Hot certifications include database certifications such as Microsoft Certified Database Administrator and Oracle Certified Professional. Other marketable certifications include project management and security certifications, particularly those relating to forensics, hacking and intrusion detection, firewall analysis and security areas dedicated to Unix and Windows administration.

Still, you should be aware that obtaining a certification is only a temporary breather, because there's usually a finite window of 12 to 15 months during which employers will pay skills and certifications premiums. Therefore, you should view any one particular certification that you earn as just another important step in a program of lifelong learning.



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at **www.computerworld.com/career_adviser.**

WORKSTYLES

Walking the Aisles At Office Depot

Ingrid Kluth talks about how Office Depot's IT staffers try to "walk in the shoes" of the business users they support by tagging along on sales calls and picking inventory out of a warehouse.

What are the most critical systems supported by your department on a daily basis? "There are the customer-facing systems — in our retail stores, in the call centers, over the Web — and our voice recognition system. And we have a whole suite of warehouse management systems, as well as planning systems that do forecasting, replenishment and receiving and, finally, our back-office systems."

How would you describe the pace? "It's aggressive and challenging but reasonable. I tend to work long hours, and there are still people here when I leave. But we don't mandate that."

How much interaction does your IT department have with users? "We like the 'walk in the user's shoes' approach. We send IT people into training with the marketing people or have them ride along with the sales reps so they have a better appreciation of what they do.

"There's nothing like going into the store and putting up shelf labels to appreciate what an employee does. Or going into the warehouse in the middle of the night to pick out six packs of different pens for a customer. There's nothing like using the systems you built to understand where there are opportunities for improvement the next time."

What do you think makes your company's IT department unique? "What I find unique is that there are equally ardent passions from many aspects of IT — for creativity, quality, technology, whatever area they're in — and how we

Office Depot Inc.

Who they are: Office products retailer in various channels, including stores, direct mail, contract delivery, the Internet and business-to-business e-commerce.

Main location: Delray Beach, Fla.

Interviewee: Ingrid Kluth, senior vice president, systems development

Number of IT employees: 500

Dear Career Adviser:

I'm a 58-year-old with a background in mainframe tech support, hardware, power and cooling who has recently been laid off. I have some software and PC experience and am a jack of all trades, including liaison work between field engineers, headquarters and manufacturing.

If I were to learn something new, what should I consider? What are some marketable skills I could pursue? I don't even know how to find a job.

— PICKING UP THE PIECES

Dear Pieces:

You may not be aware that you have access to free career assessment counseling, training and possibly funding for additional education through the more than 1,800 "one-stop" career centers throughout the U.S. These one-stop centers, which are funded by the Workforce Investment Act (WIA) of 1998, provide all types of career services to adults and dislocated workers, including computer professionals.

To find the one-stop career center in your area, go to *www.servicelocator.org/office_search.asp*, call (877) US2jobs, or e-mail askwia@doleta.gov for a listing of WIA offices in your state.

America's Career Kit, located at *www.eworkforce.org/careerkit*, offers national job listings. Many states have their own job listings online, including New York's *www.hightechny.com* Web site, which lists 40,000 openings in the IT industry.

Finally, if you apply for funding to learn new skills, be patient — getting one of these grants requires significant hoop-jumping. In addition, the size of the grant will vary depending on what area you're in — you might get $6,000 from one location and $8,000 from another. ▶

value that diversity."

What are examples of how you value those differences? "I have an individual on staff who is not a developer and not someone you'd normally find in an IT department. He's someone who can look at data and can find patterns and draw conclusions or inferences that make the business or IT think differently about things.

"We have another individual who was passionate about voice recognition technology. He personally marketed it to the business as a customer ordering tool. Once he did the pilot, we could see usages for that technology elsewhere.

"And we have people who love the intricacies of Java code, and they've developed training courses for the IT department."

- Mary Brandel
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TECHNOLOGY

THIS WEEK

CORE SECURITY

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QUICKSTUDY

Universal Serial Bus is a modern standard for connecting peripheral devices to a computer using a single connector that replaces serial, parallel and network connections. **PAGE 61**

HANDS ON

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MAXTOR'S 3000LE is a great backup drive.

EMERGING TECHNOLOGIES

Trying to sort out the differences among the various wireless LANs and choose which to implement? Here's information that can help. **PAGE 63**

SECURITY JOURNAL

In investigating recent spam attacks, security manager Vince Tuesday discovers that his own company has become an unwitting culprit. **PAGE 64**

NICHOLAS PETRELEY

An XML 'Breakthrough'

ALLOW ME TO HAVE ONE LAST RANT about XML before I finally admit that I've discovered a marvelous use for it.

A few years ago, you could sell almost anything by slapping a "fat-free" label on it. There was fat-free ice cream, fat-free brownies, even fat-free socks. The "fat-free" designation doesn't sell goods like it used to, but you can still sell just about anything by calling it a "technology."

Better still, combine *technology* with the word *breakthrough*, and your retirement is but an infomercial away. For example, nobody in his right mind would buy a chopstick and a rubber band for $19.95. But if you call it "Wonder-bun, a breakthrough in hair style technology," I guarantee you'll sell thousands.

I don't know about you, but it annoys me when someone wraps hair around a stick, calls it a breakthrough technology and gets away with it. That's why I cringe every time I see the phrase "XML technology." XML isn't a technology. XML is a text-based syntax to describe hierarchical data. In plain English, XML wraps text labels around data the way you'd wrap hair around a chopstick.

The only reason XML gets as much attention as it does is because software hucksters (most of whom hail from Redmond, Wash.) hyped it as a technology. But don't take my word for it. Here's a way to put it in perspective for yourself. XML started as a 26-page subset of the more complex, 500-plus-page specification called the Standard Generalized Markup Language (SGML).

By sheer weight alone, SGML should command at least 20 times the respect of XML. But when I tried a Google search for the exact phrase *SGML technology*, I found only 433 hits, and most of the articles were about XML, not SGML. When I searched for the exact phrase, *XML technology*, however, I got around 33,000 hits! (For a real kick, search for *HTML technology*, the results of which prove you can attach the word *technology* to virtually anything, including fat-free socks.)

Now that I've gotten that out of my system, let me share an idea I had based on some materials I was reading about a cool-sounding product called ILOG JRules 4.0 (*www.ilog.com*). JRules works around the tricky problem of having to propagate changes to your business rules when your applications and data are scattered across different servers and platforms. JRules seems like an excellent product, and it supports a variety of technologies and chopsticks such as Java, XML and XSLT. The literature implies that you can build and manage all of your business rules in one place and then deploy them to all of your servers and client programs, usually as Java-based objects.

Here's what I'd prefer instead (my apologies to ILOG if JRules already works this way). I'd like to see a rules server that revolves entirely around XML or a variant of XML, such as the Business Process Modeling Language (BPML, see *www.bpml.org*) or Business Rules Markup Language (also known as BRML or CommonRules, see *www.alphaworks.ibm.com/tech/commonrules*). These proposed standards rely heavily on the extensible part of XML to make it more useful for rules-processing. For example, BPML adds programming elements such as *if, then* and case statements, which you'll need for anything but the most trivial business rules.

I'd want to be able to define and manage business rules and processes through a friendly graphical interface like you can with JRules. But this hypothetical rules server wouldn't deploy anything. All future server or client applications would simply query the rules server to see what business logic to apply to any given transaction. The rules server might send the appropriate BPML file as a response, perform the calculations and return results, provide the rules as Web services, or all of the above. Regardless, you get to truly manage your business processes in one place.

You can find the best description of what I have in mind in a presentation at *http://oopsla.acm.org/oopsla2k/postconf/tavorath.pdf.* Apparently KPMG International, a global consulting firm, implemented a system using precisely the kind of design I've described. I wish I'd thought of it in time to get a patent on the idea. I guess my only option now is to make an infomercial and sell this breakthrough in rules technology for $19.95. ▶

NICHOLAS PETRELEY is a computer consultant and author in Hayward, Calif. He can be reached at **nicholas@petreley.com.**

Securing THE Center

As companies offer customers and partners access to their networks via the Internet, they must beef up critical systems security.

BY JAIKUMAR VIJAYAN

HEIGHTENED CONCERNS ABOUT cyberterrorism and the increasing need to open internal networks to outside access are pushing corporations to bolster data center security, both on the IT front and physically.

The goal is to add multiple layers of protection and redundancy around the data center infrastructure and software while still maintaining the levels of service demanded by the business.

On the physical side, companies are boosting their business continuity and disaster recovery capabilities by buying and building redundant hardware and facilities and geographically separating their IT assets. The technology effort, meanwhile, is focused on supplementing traditional firewall protection with newer intrusion monitors, access control tools and tougher IT usage polices.

The need for such protection is being driven by cyberthreats and the growing use of the Internet to link companies with partners and customers, says David Rymal, director of technology at Providence Health Systems in Everett, Wash.

MICHAEL BARTALOS ILLUSTRATION

"There is an increasing pressure to enable wide and unfettered access from our business units. We are getting so many requests to open up ports in our firewall that pretty soon it is going to look like Swiss cheese," Rymal says. "The more of them you have open, the more vulnerabilities you create."

The whole notion of Web services, under which companies link their systems with those of external partners and suppliers, is only going to increase the need for better security, users say.

Adding to the pressures is the growing number of remote workers and the trend toward wireless applications. This has meant finding better ways of identifying and authenticating users and controlling the access they have on the network.

"You have to keep in mind that the minute you open your servers or services to the Internet, you are going to have bad people trying to get in," says Edward Rabbinovitch, vice president of global networks and infrastructure operations at Cervalis Inc., a Stamford, Conn.-based Internet hosting service.

While it's impossible to guarantee 100% security, companies should make things as difficult as possible for outsiders or insiders to steal or damage IT assets, IT managers say.

Cervalis' security, for instance, begins at its ingress points — where the Internet meets its networks. The company uses strict port control and management on all of its Internet-facing routers to ensure that open ports don't provide easy access for malicious attackers.

Redundant, load-balanced firewalls that are sandwiched between two layers of content switches filter all traffic coming in from the Internet. Network-based intrusion-detection systems are sprinkled throughout the Cervalis network.

Cervalis is beta-testing an anti-denial-of-service

PROTECTING DATA CENTER SERVICES

- **Be sure to physically secure data centers and IT infrastructure.** Protect against natural disasters, malicious attacks and internal threats.
- **Have multiple means of identifying and dealing with attacks.** Supplement firewalls with host- and network-based intrusion monitors, antivirus software and access control technologies.
- **Compartmentalize networks, services and functions as much as possible.** This makes it easier to manage risks and isolate failures.
- **Build business continuity and disaster recovery plans.** Replicate data and services. Geographically separate critical IT assets where possible.
- **Have strong identity management and access controls.** Know who's on your network, what they're doing and what they're allowed to access.
- **Secure wireless and remote access.** Make sure telecommuters, mobile workers and outside partners don't leave an open doorway into your network.
- **Administer, audit and maintain.** Regularly change passwords and IP addresses, update patches and antivirus software, delete old user accounts, and benchmark against best practices.
- **Back up data regularly.**
- **Be prepared for incidents.** Know what to do when attacked. Have an incident response team.
- **Spell out a clear IT policy to users, and enforce it.** Stress the importance of using only approved services and strong password policies, and emphasize the risk of malicious attachments and other threats.

attack tool from Israeli start-up Riverhead Networks The tool will let Cervalis quickly isolate denial-of-service traffic that's directed against a particular Web site or server belonging to a hosted customer, without affecting the rest of the network.

Companies are also building "air gaps" between their outside-facing applications and back-end data. Providence, for instance, doesn't permit external Internet connections or wireless access to terminate on any internal machine. It's far safer to end such connections outside the firewall and then tunnel all requests through secure services, Rymal says.

Antivirus and e-mail filtering tools are being supplemented in many companies with new measures aimed at reducing the risk of attack via e-mail.

"E-mail, to me, is always the weakest link, because you are open to just about anything and everything that comes over the [Web]," says George Gualda, CIO at Link Staffing Services Inc. in Houston.

Link prohibits attachments of certain types and sizes on its network. All Internet-based chatting is banned, and users aren't allowed to download and install software. Scripting functions are disabled to prevent unauthorized scripts from wreaking havoc, says Gualda.

Link uses a secure virtual private network (VPN) service from OpenReach Inc. in Woburn, Mass., to connect its 45 remote sites. The OpenReach VPN provides firewall and encryption services, but Link placed an extra firewall in front of the VPN anyway.

Compartmentalizing networks based on the services they run makes it easier to isolate and respond to security breaches, says Lee Robertson, chief of IT security at Schlumberger Network Solutions in London.

Schlumberger used this approach — together with a slew of access control, user authentication, strict port management and intrusion-monitoring techniques — to secure the internal network at the Winter Olympics in Salt Lake City earlier this year.

"If we saw an attack, we would have been able to rapidly shut off that portion of the network which was affected and bring the service back up [on a redundant network]," Robertson says.

Good security also requires good systems configuration management, says Tony DeVoto, systems manager at Montvale, N.J.-based Volvo Finance North America. Breaches often occur because companies fail to securely configure systems, or stick systems with easily crackable default configurations out on the Internet. Volvo uses Enterprise Configuration Manager from Woodland Park, Colo.-based Configuresoft Inc. to monitor configuration variables from each of its Windows NT and Windows 2000 servers.

Physical Security

Companies are also boosting the physical security around data centers, especially after Sept. 11.

Computer Horizons Corp. (CHC), a Mountain Lakes, N.J.-based company that offers human resources management software and managed hosting services for clients such as AT&T Corp. and Sabre Inc., has signed up to have Equinix Inc. host several of its managed application servers.

Mountain View, Calif.-based Equinix maintains a series of fortresslike data centers called Internet Business Exchanges, where clients connect to high-bandwidth lines from a variety of service providers.

Armed guards patrol each facility. Concrete bulwarks around each of the anonymous, warehouselike buildings protect the facilities from being rammed by vehicles laden with explosives. The walls of each Equinex data center — which are also hardened against earthquakes and fire — are lined with Kevlar, a material used in bulletproof jackets. The facilities are also windowless to protect against scanning.

"It would have been an enormous cost for us to have tried to do all this ourselves," says James Dipasupil, CHC's director of infrastructure services.

Running a data center out of such hardened facilities can greatly increase the comfort level of people who want to do business with you, says Mike Colon, IT manager at Simpata Inc. Folsom, Calif.-based Simpata does human resources and salary-related processing services for employers.

Simpata houses all of its data center equipment in a hardened facility managed by Intel Corp. Apart from extensive physical security, Intel also provides a suite of disaster recovery and backup services, Colon says.

Like many other users these days, Simpata encrypts all data that flows from its hosted servers and client systems to protect against cracking. The servers are also constantly monitored against intruders. The result is far better security and peace of mind, not just for Simpata, but for its clients as well, Colon says.

Augmenting physical and electronic security measures with policies that are clearly articulated and enforced is also crucial, Gualda says.

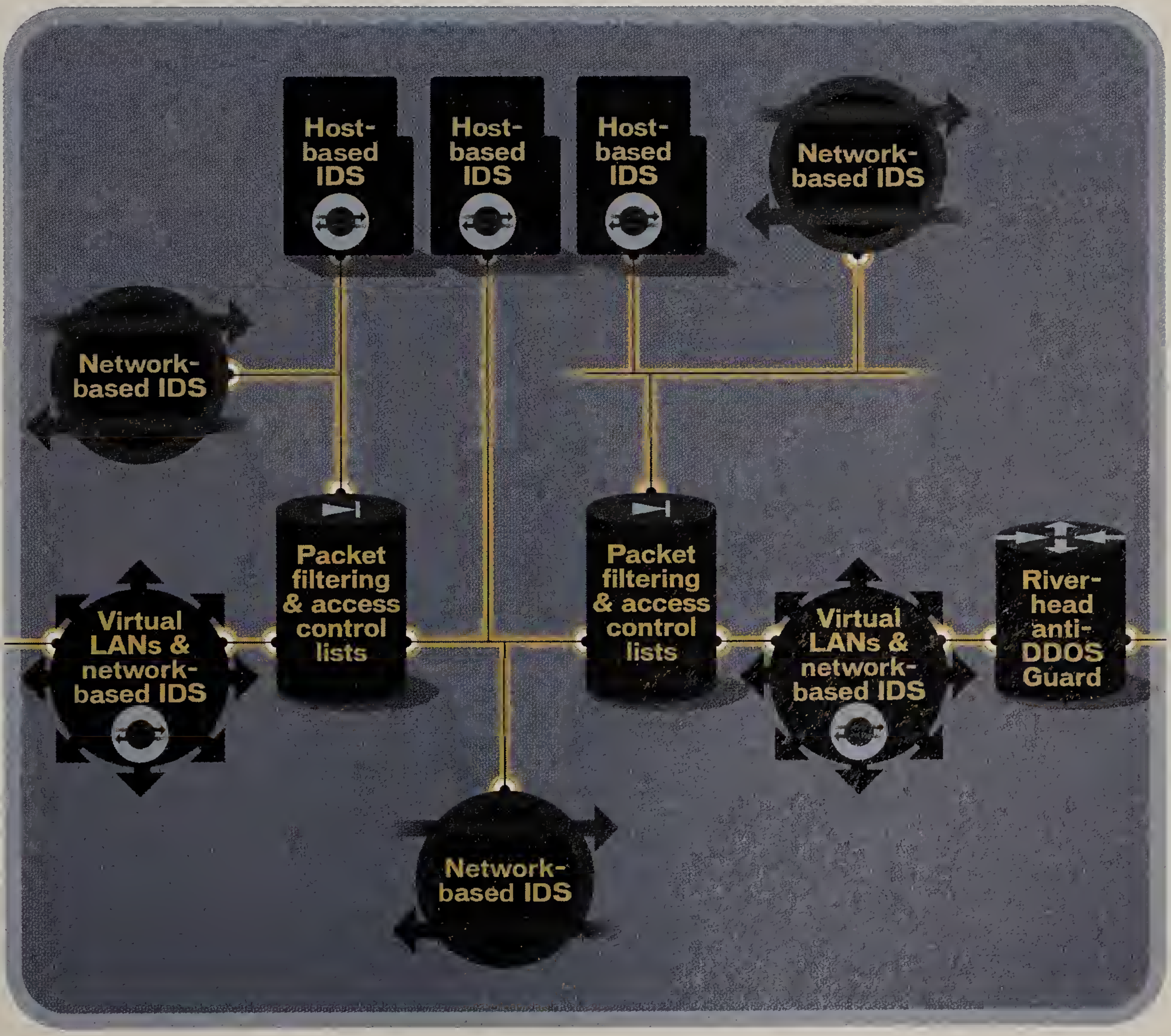
Link has a tough IT usage policy that employees must abide by. Failure to comply can result in termination, says Gualda, who has fired two employees for this reason in the past. To enforce the policy, the company uses monitoring and auditing tools to inventory employee computer usage.

Securing operations also means regularly going through a checklist of maintenance items, IT managers say. Periodic reviews and external audits are also needed to ensure that there is adequate security.

"There is never going to be a 100% security solution; there is always a theoretical way for someone to find their way through," Rabbinovitch says. "The task, therefore, is to make it as challenging as possible for the hacker." ◗

CERVALIS INC.'S MULTILAYER SECURITY ARCHITECTURE

Multiple means of identifying an attack and protecting against it are crucial to companies trying to protect data centers while allowing Web access. That means having firewalls, network- and host-based intrusion-detection systems (IDS), access control lists and technologies for dealing with distributed denial-of-service attacks (DDOS).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Host-based IDS
Host-based IDS
Network-based IDS
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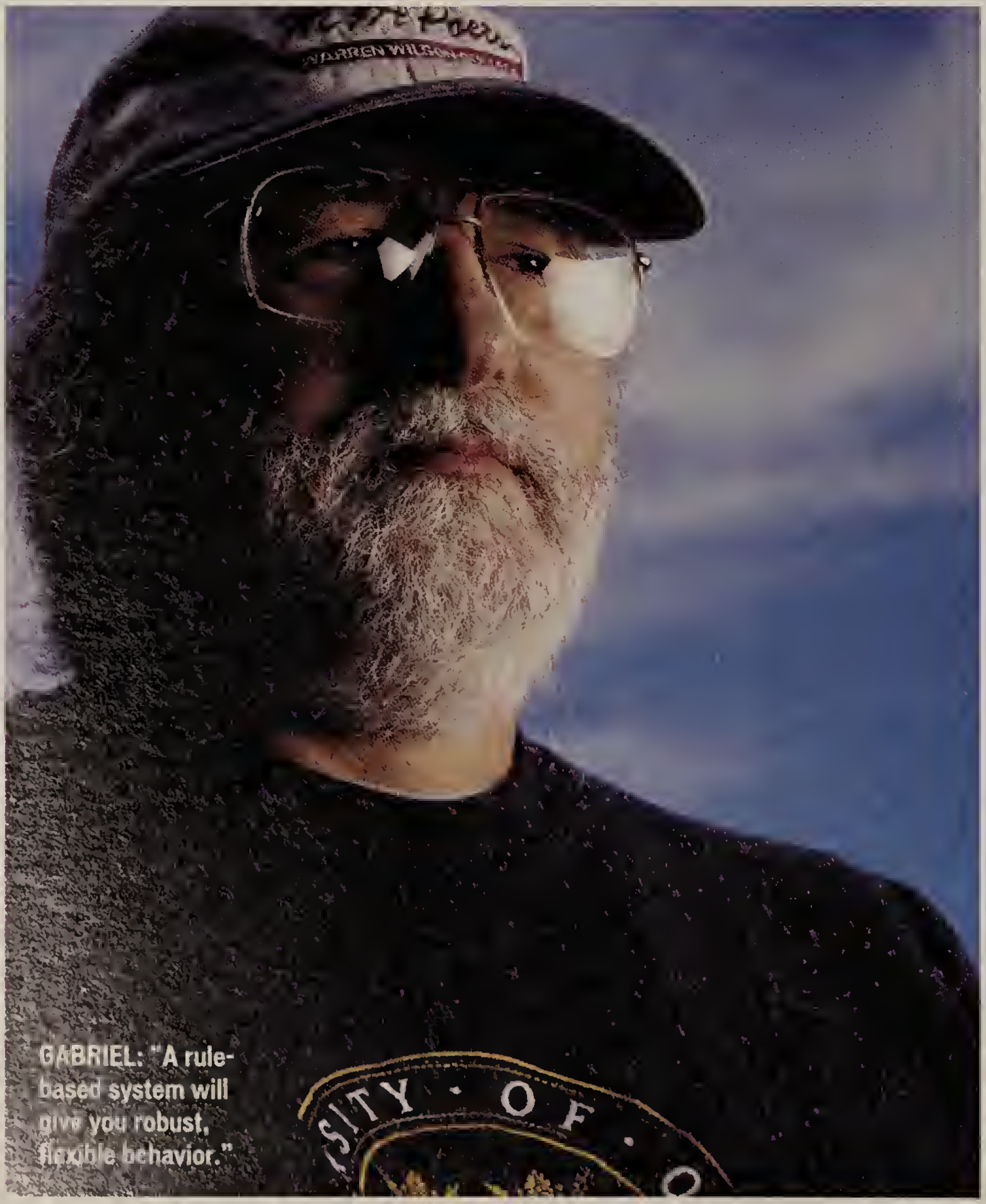
WHO IS HE?

Richard P. Gabriel is a computer scientist, author, poet, rock musician and a distinguished engineer at Sun Microsystems Inc.



GABRIEL: "A rule-based system will give you robust, flexible behavior."

Richard P. Gabriel is Sun Microsystems Inc.'s open-source expert. He has written four books and more than 100 articles, mostly about programming languages and practices. He's leader of the Feyerabend Project, whose goal is "to repair the arena of software development and practice." It was inspired by the philosopher Paul Feyerabend, who wrote in 1975, "Given any rule, however 'fundamental' or 'necessary' for science, there are always circumstances when it is advisable not only to ignore the rule, but to adopt its opposite." Gabriel recently told Computerworld*'s Gary H. Anthes what's wrong with software today and how it might be improved.*

What's wrong with today's programming languages? They are brittle. They were based on the assumption that computers were for scientific and engineering applications. They were designed when computers did thousands of instructions per second, not billions. And when computers cost millions, programmers cost $12,000 a year. Now developers cost $50,000 to $200,000 a year, and they can each have the equivalent of five Cray 2's [supercomputers] on their desk. So it's time to use some of that CPU power to help the programmer.

How could languages be less brittle? The software we build doesn't exhibit homeostasis — that's when an organism is perturbed, it tries to return to its normal state. When someone hacks into a Unix system and does something bad, it doesn't get better until someone repairs it and it is rebooted. But you could make every component in the system tend toward its default state over time. You could have the programming language set up so that your system kind of gravitates back toward its initial state. If you had proposed that in 1959, when programming language ideas were being thought up, they'd have said, "That's crazy. Why would we waste our computers' time doing that?"

What else could be done? From the late 1970s to the late 1980s, folks in the artificial intelligence world tried to program computers differently, with languages like LISP. They had expert systems, which is an easier way to program a computer and not as susceptible to errors. On the other hand, the results that you got might not be precisely what you expected. A rule-based system will give you robust, flexible behavior which is at the 95% level, but certainly sufficient. We have abandoned all of these ways of programming. Java goes a fair way to some of these goals, but still there is a relentless insistence on correctness and precision instead of flexibility and adaptability.

FUTURE WATCH

Are you suggesting we write applications today as expert, or rule-based, systems? Is that possible? I am taking Microsoft Word and programming it up as a rule-based system. Maybe there is enough horsepower for every keystroke to be interpreted by rules. Then, if one of your colleagues added something to their version of Word that was written that way, all you would have to do to incorporate those things is just throw them into your pile of rules. You could add or change rules, and the thing wouldn't break. It's a proof of concept to see if there's enough horsepower in the computers to do this.

You've suggested that users are not involved enough in software development. How can you get user involvement? Software designers put their backs to the world and they face technology. Their lingua franca is source code. If you can't talk source code, they won't pay attention to you.

But if you look at something like extreme programming, which tries to involve the actual users right away, they build a little bit, they give it to the users, they get feedback right away before they have made a lot of commitments and they incrementally build something that is maybe pretty darn good in the first release. They've built something better and faster and saved their shareholders money.

What's the next milestone for the Feyerabend project? We just held a workshop in which we came up with a set of problem statements that can guide the research of software folks over the next 10 to 20 years.

For example, "Design a system where if someone deletes 1KB of code, the system will self-repair in 24 hours." I will be summarizing the workshop in the next month, and we will publish a manifesto. Maybe some prizes will be given for them. ◗

SOFTWARE GOALS

To read more about the problem statements that scientists involved in the Feyerabend project have developed, visit our Web site:

QuickLink: 29354
www.computerworld.com

High-Speed Serial Ports

DEFINITION

Universal Serial Bus (USB) is a modern standard for connecting peripheral devices to a computer using a single connector that replaces serial, parallel and network connections. USB delivers both power and data, and up to 127 USB devices can be daisy-chained together. USB 1.1 operates at up to 12M bit/sec., while USB 2.0 delivers up to 480M bit/sec. **IEEE 1394**, a competing technology (also called FireWire and iLink), delivers 400M bit/sec.

BY RUSSELL KAY

WITHOUT some good means of input and output, a computer makes a pretty good doorstop or boat anchor. Once we start plugging things into a computer, however, it can receive data and instructions, control other machines, and produce text and images on paper or on a screen. But "plugging in" implies the existence of sockets, jacks or other types of fittings into which something can be connected.

Though it seems like such a simple idea, plugging in calls for standards of compatibility and interoperability, both mechanical (will it fit?) and electrical (will it work?). For example, consider the lowly electrical outlet in the wall. It has two or three prong holes in a standard arrangement, and in the U.S. we can expect it to provide 110 volts of 60-Hz alternating current electrical power. Go to the U.K., and you find incompatible plugs and outlets delivering 220 volts that can fry your American appliances.

Computers aggravate this problem because they use a multitude of different connectors — and sometimes use the same type of connector for entirely different devices.

As technology has advanced, older connectors often couldn't handle the newer, higher-density signals, and replacements had to be created. Thus the number of different connectors grew, until the industry realized that it had to simplify things.

The Universal Serial Bus (USB) idea was launched by Intel Corp. with the goal of replacing virtually all other connectors except for video. It was then taken up by many other companies, and in 1995 the USB 1.0 standard was announced. In 1997, a Portland, Ore.-based organization called USB Implementers Forum Inc. was created to coordinate USB development and standards.

USB developers also took the opportunity of the clean, new design to add a significant new capability: USB connectors and cables can deliver not only data to an attached peripheral, but power as well, thus eliminating the need for (and the cost of) those bricklike power-supply transformers that come with so many peripherals.

Today, most desktop computers and laptops have at least two USB ports, and they may or may not have the older legacy connections.

With USB, you can often connect one device to another in a daisy-chain fashion. Thus a mouse can connect to a keyboard instead of plugging into the back of the computer. And that keyboard can connect to a USB port in the monitor. If you need more USB ports, just connect a hub and get three to seven more ports. In theory, at least, up to 127 USB devices can be interconnected.

But for users and IT management, the best thing about USB may be that it simplifies the installation of new peripherals. Many don't even require separate drivers. The computer recognizes the device and installs whatever is needed. And the user can plug or unplug whenever he wants, without having to do anything else.

THE STANDARD USB B and A connectors work with most modern peripherals.

Faster!

Within the past few months, USB 2.0 has become a reality, offering up to 40 times the throughput of the earlier 1.1 standard, which was announced in 1998. The 2.0 devices will also work with older USB ports but only at the older, slower speeds.

To get a sense of what this increase means in practical terms, I recently compared backup times to a Maxtor 3000LE 120GB USB 2.0 external hard drive (see story, page 62). For USB 1.1, I simply connected the drive to my laptop's built-in USB port. For USB 2.0, I tried out PC card adapters (seemingly identical except for their labels) from Richmond, Calif.-based Keyspan, a division of InnoSys Inc., and from IOgear Inc. in Irvine, Calif. Over USB 1.1, it took 422 seconds to transfer 355MB, while USB 2.0 required only 48 seconds for the same data.

In comparison, copying the same data to another folder on the laptop's hard drive took 93 seconds while copying it to a Toshiba CardBus 5GB drive took 498 seconds.

The most recent variation is called USB On-the-Go (OTG). Its smaller connectors let devices communicate directly, without a PC or a modem. Two OTG-equipped digital cameras can exchange pictures by hooking a cable between them. We can expect to see OTG appear on phones, personal digital assistants and notebook computers.

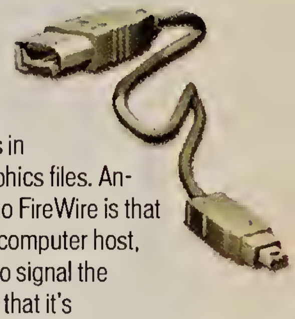
USB devices use a small four-pin connector (two for power, two for data) rather than the much larger connectors typical of serial devices. ▸

FireWire, The Alternative

Before USB, the primary high-speed serial connection was that defined by IEEE standard 1394 – better known by the name Apple Computer Corp. gave it, FireWire. (Sony Corp. and others call it iLink.)

Announced by Apple in 1995, FireWire was used for high-speed data transfers and for downloading digital video direct from FireWire-equipped camcorders. With a transmission rate of 400M bit/sec., FireWire handily outsped USB 1.1's 12M bit/sec. maximum throughput and gave it a real advantage where speed was essential, such as in moving large graphics files. Another advantage to FireWire is that it doesn't need a computer host, nor does it need to signal the other component that it's "alive," as current USB implementations must. This kind of data interruption makes USB impractical for most professional video work.

The 1394 connectors are smaller than their USB counterparts.



However, Apple gets a small royalty for each product that uses Firewire, and FireWire is more expensive to implement. These two factors have prevented FireWire from supplanting USB in low-end computer peripherals, where cost is critical.

Like USB, Firewire can daisy-chain peripherals together (up to 63, in a treelike structure), and it delivers up to 60 watts of power to peripherals. Firewire allows peer-to-peer device communications and allows hot-plugging and -unplugging. Cable length is limited to 4.5 meters between devices.

With USB 2.0, FireWire has been leapfrogged. However, a higher-speed release of FireWire is expected to up the ante again, providing speeds of up to 2G bit/sec.

– Russell Kay

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New, Hard-Driving Disks

Today's disk storage is cheap – really cheap – and faster than ever. By Russell Kay

MAXTOR'S 3000LE is a great backup drive.

I've recently been using several new hard drives from Seagate Technology LLC, IBM, Western Digital Corp., Toshiba America Information Systems Inc. and Maxtor Corp., and they represent remarkable advances in capacity, speed, compactness and reliability. Moreover, these improvements aren't limited to one or two makers. All five drive manufacturers are demonstrating innovation and new technologies (see chart).

Twenty years ago, when I was working at a university and taking graduate computer science courses, another student asked me if I'd be willing to go in with him on a group purchase of hard-disk cartridges for a Digital Equipment Corp. PDP-11 computer. Just think, he said, "5MB, and it's just $125." These disks used 14-in. platters in a housing that was 2 to 3 in. thick. Currently, my laptop computer is running a 60GB hard drive with 2.5-in. platters that are 0.5-in. thick. In other words, volume for volume, my current drive is more than 800,000 times as efficient as that old Digital disk.

HANDS ON REVIEWS

A prediction known as Moore's Law states that computing power doubles every 18 months, and this has pretty much held true since it was first pronounced (in slightly different form) in 1965. But when it comes to rapid growth, semiconductor density and CPU power can't hold a candle to magnetic storage capability. In fact, since 1997, relative disk storage capacity has doubled every year.

Performance is the watchword for all three 3.5-in. internal drives I looked at. The Seagate Barracuda and Western Digital Caviar SE run at 7,200 rpm, which speeds data access. In addition, the drive from Lake Forest, Calif.-based Western Digital has an 8MB buffer — four times the size of the Barracuda's — which makes it even more efficient. Both drives are remarkably quiet in operation, making effective use of fluid bearings to dampen any noise.

The Cheetah X-15 from Scotts Valley, Calif.-based Seagate is another animal entirely. With its Ultra 160 SCSI interface and platters spinning at 15,000 rpm, this drive is aimed squarely at servers. Although no noisier when idling than the others, while working it produces discernably more sound than they do, and it's not the sort of drive you'd normally want or need in a desktop machine sitting next to a user. Adding to its attractiveness for server, RAID and other mass storage uses, the Cheetah X-15 has the longest-rated mean time to failure of any drive on the market today — 1.2 million hours. It's clearly designed for continuous run reliability.

A word about my evaluations: I didn't run a lot of timing and speed tests to verify the claimed performance of these drives. I installed and used them in a variety of applications and I/O-intensive tasks and judged their relative merits somewhat subjectively. (At one point, I had one desktop computer running all three hard drives with a combined total capacity of a quarter of a terabyte!) All three drives were fast, though the Cheetah was the swiftest of the group by a noticeable margin.

The Specialists

The other three drives I looked at are each designed for a special purpose. The IBM Travelstar at 60GB is currently the highest-capacity 2.5-in. drive available for laptops. The product from Toshiba's Storage Device Division in Irvine, Calif., is almost thinner than you can imagine a hard drive being, yet it holds 5GB (and a 10GB model will shortly be available) and plugs into any laptop and many handhelds. It's a great backup drive.

The Maxtor 3000LE is also a great backup drive, but its size and weight mean you don't want to carry it around. An external drive making use of Universal Serial Bus 2.0's transfer speed, the Maxtor's 120GB can store more data than even most MP3 aficionados are likely to accumulate.

The bottom line is, disk storage has never been so cheap or so fast. For desktop use, and at street prices of $1 to $2 per gigabyte, the Barracuda and Caviar SE represent terrific values, and the 15,000-rpm Cheetah has unparalleled speed. Having sufficient disk space in a notebook is now just a matter of specifying what you want, and it's pretty darn cheap, too. Finally, external and removable drives offer fast, cost-effective backup, whether you're at home or on the road. ◗

TOSHIBA'S MK500 is almost thinner than you can imagine a hard drive being, yet it holds 5GB.

SEAGATE'S BARRACUDA runs at 7,200 rpm, and at a street price of $1 to $2 per gigabyte, it's a terrific value.

IT'S NOT RUST, IT'S PIXIE DUST

For a discussion of the technology in IBM's 60GB Travelstar, visit our Web site:

QuickLink: 29312
www.computerworld.com

Drive for More Storage

If you're looking for the latest in disk drive storage, check out what these five manufacturers have to offer in improved capacity, speed, compactness and reliability.

MAKER	MODEL/PLATTER SIZE	CAPACITY	COST
IBM Corp.	Travelstar 60GH/2.5 in.	60GB	$400
Maxtor Corp.	3000LE/3.5 in.	120GB	$250
Seagate Technology LLC	Barracuda ATA IV/3.5 in.	80GB	$110
Seagate Technology LLC	Cheetah X-15/3.5 in.	36GB	$400
Toshiba America Inc., Storage Device Division	MK5002MPL/1.8 in.	5GB	$380
Western Digital Corp.	Caviar SE/3.5 in.	120GB	$230

Wireless at Full Throttle

First-generation 802.11a wireless networking products turbocharge throughput, but for most enterprise applications, 802.11b is still the best bet. By Robert L. Mitchell

EMERGING TECHNOLOGIES

JUST AS wireless LANs (WLAN) based on 11M bit/sec. 802.11b (Wi-Fi) technology have started to catch on in the enterprise, vendors have begun shipping products based on the new 802.11a specification (Wi-Fi5, pronounced "why five"), which is two to five times faster, depending on transmission distance. And products based on yet another high-speed standard, called 802.11g, could be available as soon as mid-2003.

Confused? So are many enterprise IT managers, who have been left wondering which WLAN technology to deploy and whether a migration path will emerge that will let them preserve that investment in the future.

The specifications themselves may provide some answers. In addition to its faster 54M bit/sec. data rate, 802.11a devices operate on eight channels as opposed to 802.11b's three, reducing interference between the wireless hubs, called access points. It also uses a more efficient transmission technology that's less susceptible to some types of interference. And 802.11a operates in the 5-GHz frequency range, which is less crowded than the unlicensed 2.4-GHz range used by 802.11b.

In contrast, the still very preliminary 802.11g specification could become a faster version of b, possibly boosting the data rates for the three b channels to 802.11a speeds [QuickLink: 27922].

Because a and b devices operate in different frequency bands, they can run in parallel. Some vendors already offer "dual mode" a/b access points that serve both client types. 802.11g, on the other hand, may be seen as more of a replacement for 802.11b. It will support b clients, but users probably won't be able to flip the switch to g speeds until all b clients within range are upgraded.

Analysts say 802.11a adoption may be slow in part because the extra bandwidth isn't a big draw for most enterprises, which typically use the technology in warehouse, loading dock and distribution center applications. In the office, the technology is typically used as an overlay, rather than as a replacement technology for faster, wired Ethernet. Again, typical applications tend to be low-bandwidth ones.

Another issue is maturity. Most early 802.11a products are designed for home and small-business use, and the enterprise-class features are still evolving, says Ken Dulaney, an analyst at Stamford, Conn.-based Gartner Inc. The 802.11b technology still has more sophisticated management capabilities, and 802.11a isn't yet approved for use outside the U.S.

Another consideration: While most applications are for handheld devices, 802.11a's 32-bit bus architecture supports the Mini PCI and CardBus formats, but not the PC Card, secure digital or compact flash formats common on many handhelds.

Ken Pasley, managing director of wireless systems development at FedEx Services, the IT support unit of Memphis-based FedEx Corp., is cautious. "We'd like to move to a higher speed, like 802.11a, [but vendors] are really about six to 12 months away from having something we can do strong testing with," he says. Pasley decided to deploy 802.11b for FedEx's distribution center and office applications and says he wants to see a "clear road map" for migrating from b before making any moves.

"Don't even think about [deploying 802.11a] until mid-2003," advises Dulaney. By that time, he says, "a whole lot of things will start to converge," including the availability of better encryption and Wi-Fi5 interoperability certifications of 802.11a products.

But for now, "you have a lot of product out there. It's half-baked," Dulaney says. "Sit back, buy b, and don't worry about it." ◗

■ PRODUCT PIPELINE

Not Ready for Enterprise Players

Of the first-generation 802.11a products available, few are designed and marketed for enterprise use. And despite the fact that all designs are based on the same chip set from Sunnyvale, Calif.-based Atheros Communications Inc., speed, range security and management features vary widely.

Enterprise IT managers are also a picky lot when it comes to selecting a brand. "Nine out of 10 [Gartner enterprise] customers say they want Cisco," says Gartner's Ken Dulaney, and Cisco Systems Inc. won't release an 802.11a product until at least midyear. Also, some makers of industrial handhelds, such as Symbol Technologies Inc. in Holtsville, N.Y., are waiting for second-generation silicon before releasing products.

Of the products available today, Sunnyvale, Calif.-based Proxim Inc.'s Skyline and Harmony models and Intel Corp.'s Pro/Wireless 5000 offer the most promise for enterprise use. But there's plenty of room for improvement. For example, a recent *Network World* review judged Proxim's Harmony equipment access to be fast but inconsistent, while Intel's 5000 was substantially slower. Overall, testers found 802.11a devices generally easier to set up and configure than 802.11b equipment. But prices can be 50% higher than for comparable b devices.

More sophisticated designs are on the way that could bring more advanced features and better management capabilities. Atheros recently announced a second-generation chip set that supports dual-mode operation, and competing designs from Intel and Intersil Corp. in Irvine, Calif., are expected in the second half of this year.

– Robert L. Mitchell

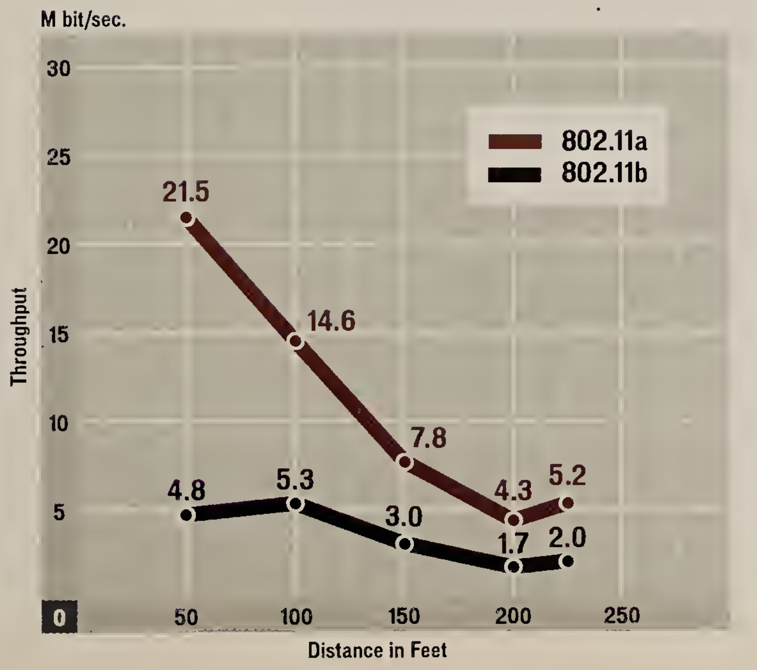
■ TECH CHECK

Not-So-Fast Talk

With wireless Ethernet specifications, the data rate you see on the box isn't the throughput you get. "The efficiencies have been about **50% or 60%**" due to network protocol overhead and environmental factors, says Ray Martino, vice president of network products at Holtsville, N.Y.-based Symbol Technologies Inc.

That means a 54M bit/sec. 802.11a connection would deliver, at best, about **26M bit/sec.** of throughput, vs. about **5M bit/sec.** for 802.11b. While tests show 802.11a to be about five times faster than 802.11b at close proximity, its throughput curve drops more sharply as distance increases. According to a white paper by Sunnyvale, Calif.-based Atheros Communications Inc., throughput drops to 22.5M bit/sec. at 65 ft. and to 15M bit/sec. at 100 ft. That's still **two times faster** than 802.11b, but achieving higher data rates will require placing more access points for a given coverage area.

In addition, lab tests conducted by *Network World* magazine and others cite throughput rates substantially lower that those provided by vendors, ranging from about **12M bit/sec.** to **23M bit/sec.** And the higher numbers were posted by devices operating in proprietary **"turbo"** modes. Vendors and analysts anticipate improvements as products mature.



THE 802.11X FILES

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Company Becomes Culprit In Ongoing Spam Attacks

Efforts to stamp out aggressive spam attacks lead security manager Vince Tuesday far and wide

BY VINCE TUESDAY

SECURITY MANAGER'S JOURNAL

Every year, it seems my company gets more and more spam, and much of it is offensive. An employee in our public relations department recently received a particularly bad example.

The unsolicited e-mail advertised a child pornography Web site. The employee, both offended and frightened that management would think he had requested the information, passed it on to our human resources department. Human resources in turn passed it to our physical security team, which contacted local law enforcement officials. My team was called in to identify the source.

The From header indicated that the e-mail came from the domain of a game company in Hong Kong. It probably wasn't the culprit. The header is much like the return address on a letter: You can insert whatever address you like. We dug further, but we used an external Internet account so others wouldn't know that our organization was investigating.

From Russia, With Love

The pornography Web site's Domain Name System name was registered to someone in the U.K., but the name servers hosting the zone files were in Russia. The Web server in question was associated with the registrant's Internet service provider in Moscow. But the service provider offers wireless connectivity, which makes it much harder to find the physical server at the other end of the connection.

We decided against visiting the Web site itself — we don't want child pornography images in our cache or on our machines. Besides, the spam might be a law enforcement sting with a fake server, or the authorities might be waiting to raid the real server and be monitoring connections to the server in the meantime.

How did the e-mail get to us? By reading the series of headers on the e-mail, we traced it back to a mail server at a computer consultancy in Utah. It had apparently misconfigured its server, allowing anyone to connect.

You can report spam to services that test the source-mail servers to see if they're correctly set up. If so, the service adds the server to its blacklist and notifies the owner. We found the consultancy's server on one of these lists, so we knew it had been notified about the problem.

This convoluted web of international lies and deception reads like the plot of a James Bond novel but is normal for spam. It makes it very hard for anyone to take action against the spammers, because any legal action would involve numerous companies in many different jurisdictions. Although the total spam burden is expensive, each individual e-mail message doesn't cost that much time and storage, so we couldn't sue for much anyway.

In addition, all of the information we got from headers and probing doesn't really prove anything. Nearly all of these records and registrations can be faked or stolen, and even the information that our mail servers log can be confused and distorted by a skilled spammer. So we wrote a report about our analysis and presented it to the physical security guys, who passed it on to their law enforcement friends. I doubt anything will come of it. Although spam advertising can be unpleasant and wasteful, it doesn't directly expose our company to information risk — unless it gets sent from within our company.

The Nun Who Spammed Me

Soon after that incident, we received a call about another strange e-mail. It just contained the word *test*, but the From address was an inactive account in our domain. More confusingly, the e-mail had our standard outbound disclaimer attached. Perhaps someone had broken in and was testing what he could send before he started spamming? A review of the message told the real story. The message had come from the outside with a faked internal address in the From header to increase the likelihood that it would be read.

Gullible users I can plan for, but our e-mail gateway had fallen for the same trick. It was applying the rules in a different order than we expected so that when it saw the From address associated with our site, it applied the rules for outgoing mail and stuck our disclaimer on the bottom of the message — even though the To address was also ours. If we had virus-checking working in only one direction, this could have been a catastrophic bug. As it was, we were forced to deploy a second server to separate incoming and outgoing e-mail so no confusion of rules could happen.

The machine used to inject the spam into our e-mail system was associated with a school board in New Jersey that was run by the Sisters of Mercy. If you had said at the beginning of the week that I'd be explaining spam to nuns, I think I would have offered long odds against it. Their proxy was allowing any kind of connection to be forwarded, including those using Port 25, the TCP port used for SMTP. Administrators normally use a proxy server to give internal staffers secure access to external resources, but if you don't limit who can connect to it in the first place, you can end up providing security services, like anonymity, to untrusted third parties — including spammers.

I Am Spam

Bad things always come in threes, and this week was no exception. Several antispam groups wrote to us to complain about spam coming from our networks. We knew they were wrong — our e-mail servers are very tightly configured. But then we looked at the queues on them and saw hundreds of thousands of items waiting to be delivered, nearly all of it spam.

We pulled the plug and quickly deleted the messages. But how was it getting in? Was an insider sending this nonsense? Thankfully, no. Although our e-mail servers were secure, our Web server wasn't. All of the items were originating from the low-privilege user account that runs the Web service process. It turns out we had been stung by a bug in a user-feedback script we had written to work in FormMail, our Web-based e-mail form program. We'd kept up to date with patches and with all our Common Gateway Interface scripts. But some enterprising spammer had discovered that we used that script and wrote a tool to break it and substitute the e-mail addresses of spam recipients for those of the customer-liaison staff in our company.

In the end, we had to grovel to the antispam groups to get off their blacklists. As we removed the scripts and replaced them with a much better alternative, we started to have second thoughts about how harsh we had been with other companies that had been used to originate spam sent to us. If, despite all our efforts, we could be an unwilling accomplice, what hope is there for all those companies that don't take security as seriously? ◗

This week's journal is written by a real security manager, "Vince Tuesday," whose name and employer have been disguised for obvious reasons. Contact him at *vince.tuesday@hushmail.com*, or join the discussion in our forum:

QuickLink: a1590

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STAMPING OUT SPAM

***www.mmedia.is/~bre/www.os/TheSpamSketch.html*:** Was Monty Python responsible for spam? Read the famous comedy sketch that made Spam famous and decide for yourself.

***http://worldwidemart.com/scripts/formmail.shtml*:** Go here to get FormMail, the Web e-mail form scripting tool that resulted in our spamming problems. After updating our program, we still had problems with even the latest, supposedly secure version.

***www.monkeys.com/anti-spam/filtering/formmail.html*:** Monkeys.com maintains a list of badly configured FormMail servers. To try to improve the situation, the site also offers a secure replacement version.

***http://relays.osirusoft.com/cgi-bin/rbcheck.cgi*:** Many services offer to stop spam by blocking servers used to send it – and your e-mail server could be on one of their lists. Check this site and find out.

***www.internic.org/*:** If you're trying to track down the owner of a domain name, Internic's "Whois" registry database can help.

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se_jobs_bj@appworx.com

NT SYSTEMS ADMINISTRATOR sought by NJ co. involved in computer modeling of biological systems. Must have Bachelor's in Inform. Syts. Manag., or Comp. Sci. or Comp. Eng. & 2 yrs. exp. in installation, support & troubleshooting of hardware, software, servers & NT/UNIX operating systems in LAN. Response to HR Dept. PP, Physiome Sciences, Inc., 150 College Rd. West, Suite 300, Princeton NJ 08540.EOE.

Systems Analysts/Progmr Analysts/Comp. Eng's/DBA's/wanted by computer co. inWoodbridge, NJ. Must have Bach. in Comp Sci/Comp Eng/Math or reltd field. All positions req. 1-3 yrs exp. Send resume to: HR Dept, U & X Group, 1000 Route 9 North, Ste. 203, Woodbridge, NJ 07095.

Computer Consulting Company looking for individuals to fill multiple positions

- Web based developers
- Client Server developers
- J2EE developers
- Datawarehousing

Among the skills needed are: Visual Basic, ASP, SOL Server, Java, Internal Rose, SQL Loader, Oracle, and CORBA Mid-level & Senior-level positions available. E-mail resumes to: mbeaumont@ibs.com

SolutionsIO seeks DB Engr. for HO office in Bellevue, WA. DESC: Dsgn, dev, & impl. RDBMS util. SQL & rel. multi-tiered dist. apps. util. VB, COM, ASP, Active X, script. langs, XML/XSLT on Win. REOS: MS or BS in Engr, CS, Math, or Physics or equiv. + exp. dsgn, dev, & impl. RDBMS & rel. apps. util. SOL, VB, & Win o/s + 1 yr exp. util. ASP, COM, script. langs, XML/XSLT. Prem. sal + benes. Pls. reply to A. Johnson, Job#SIQ-212, 1260-116th AVE NE, Bellevue, WA 98004.

Senior Quality Assurance Specialist. Test management, design, and environment set-up; test reports; quality assurance and control; and risk analysis. Defect tracking , management, and administration; quantitative analysis and measurements; and project management. Must have B.S. in Comp. Sci., Eng. or related, 3 yrs. exp., and knowledge of MS WAS, WinDbg, MS SOL Server 6.5/7.0/2000, MS Access, ASP, Javascript, VB, ERWIN 3.5/4.0, ADO, WIN32API, COM technologies, and CPM. Send cover letter and resume to HRSoft, LLC, Attn: Steve Alderfer, 505 North 4th St., Fairfield, Iowa 52556.

Quality Assurance Project Manager sought by telecommunications consulting company in Denver, CO to establish, develop and oversee a Quality Assurance/Testing Group. Requires Bachelor's degree in computer science, management information systems or related field, including Business Administration; 4 yrs of quality assurance exp.; working knowledge of CMM and ISO 9001 certifications and 271 compliance and working knowledge of Mercury Interactive and SOA Rational automated testing tools. Respond by resume to Nicole Lemerise, DataTrend Information Systems, 1200 17th St., Suite 1250, Denver, CO 80202.

Programmers, Jr. Programmers, Software Engineers
Design, develop, test and implement specialized software apps using data encryption technology including Amtrix, Crossworlds, Oracle RDBMS, Oracle tools and 3rd party utilities including Toad, SOL Navigator, Oracle Forms and Reports. US Workers only. Consulting positions requiring travel. Prevailing wage/benefits. Send resume to HR, DeccanTech Corporation, 4284 Veridgris Circle, San Jose, CA 95134.

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Call Janis Crowley at 1-800-762-2977

IDG Recruitment Solutions

Senior Programmer Analyst - Prime Software, Inc. a developer of client-server and Internet-based business application software currently seeks applicants for the following position in its Lisle, Illinois office: Senior Programmer Analyst. Applicants for this position must have a bachelor's degree in MIS, Engineering or related field plus 5 years of relevant experience in systems, application and program development using Powerbuilder, complex database programming in MS Sql Server, Sybase database. Web development experience in J2EE complaint Application Servers and JAVA would be required. Experience in working with full cycle projects conforming to SE1-CMM standards would be an advantage. For consideration, please forward resume to: Prime Software, Inc. Attention: Steve Good, 5007 Lincoln Ave., Suite 205, Lisle, IL 60532. EOE

SOFTWARE ENGINEERS (8 positions): require Bachelor's in Engineering/Computer Science/Mathematics/Science or closely related field with experience providing skills in described duties, at $60,000 per year; Senior Software Engineers (8 positions) with Master's and two years experience, at $65,000 per year. Provide on-site consulting in design, analysis and development of operating systems-level software for legacy systems in IBM mainframe environment; development and administration in Oracle, DB2, SOL Server and Sybase; e-commerce and web applications development in Microsoft, Java and related technologies; network management systems development with Netscape Server and related tools; SAP R/3 applications on Windows with DOS and ABAP/4 and related modules. 40% travel to client sites in the United States. Mail resume to: YASH Technologies, Inc., Human Resources, 605 17th Avenue, Suite 1, East Moline, IL 61244.

Software Professionals: RS Software, a leading, globally positioned, ISO 9001 certified, SEI CMM Level 4 & PCMM Level 3 assessed company, which provides Quality Software Solutions. It operates from India, USA & UK. Company is looking for Software Professionals with following skill-set combinations:
COBOL, CICS, DB2, IMS, JCL, IMS, IDMS, PACBASE JAVA
JAVA Scripts, JAVA Servlets, ASP, CORBA, HTML, XML, Weblogic TPF, Assembler.
DBA: Oracle, SOL Server
Networking: LAN, WAN, NT, NET, Web Architecture
UNIX, TCP/IP, SUN SOLARIS
C, C++, Oracle, Windows

Send resume to:
HR, RS Software (India) Ltd.
1900 McCarthy Blvd., #103,
Milpitas, CA 95035

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System Analyst sought by software development firm in Downers Grove, IL. Prepare and market Paradigm(R) presentation on-site; supervise sites and coordinate the installation of Paradigm(R); coordinate with Cimnet programmers and analysts team to develop simulation of Paradigm (R) testing and errors; provide technical guidance and assistance to client user personnel in the manufacturing environment; coordinate customers business financial and operational needs; provide presentation for potential clients; Must have B.S in Engg. or its equiv. & 3 yrs in system analysis. Respond to: HR Dept., 2651 Warrenville Road, Downers Grove, IL 60515.

Senior Business Analysts: Oracle Apps. 10.7/11.03/11i/PeopleSoft 7.0/7.5/8.0; Apps DBAs: Oracle RDBMS 7.x/8i/9i, Oracle Apps. 10.7/11.03/11i upgrade & migration, ERWIN, SQL Server RDBMS, SQL Server 2000/7.0/6.5/6.0 on Solaris/HP Unix/Windows NT/2000 platforms. Oracle Apps. Programmer Analysts: Oracle Apps10.7/11.03/11i (modules-GL, AP, AR, FA, PO, INV, OE/OM, HRMS, Service). Customize Oracle Apps using Oracle Developer 6i/JDeveloper for service modules. Senior Programmer/Analyst: Oracle PL/SOL, Oracle 8i, Oracle 9i, 9iAS, Developer 2000/6i; Siebel CRM/Oracle CRM Configurator and Technical Programmer/Analysts: Siebel suite incl. Communications 2000, Call Center, Energy '00, Tools 6.3/7.0/Oracle CRM 31/11i. Senior DBAs: Sybase 12.5/12.0/11.1/10.x/Oracle database 7.x/8i/9i Senior Network Engineer/Certified Microsoft Trainers: MCSE, MCT & Cisco certifications. Prevailing wage/benefits. Consulting positions requiring travel. To apply, send resume identifying position(s) interested to HR, BPO Systems, 3333 Vincent Road, Suite 216, Pleasant Hill, CA 94523. EOE.

MI Consulting Co. seeks SAS Programmer to conduct statistical analysis of data and produce tables that demonstrate the safety and efficacy of drugs tested in human trials; develop and validate computer systems as per standard operating procedures and work instructions; develop and validate systems that demonstrate secondary efficacy parameters including patient reported outcomes; extract and deliver data to biostatisticians for further analysis; develop and maintain SAS applications for summary level analysis, listing reports, user interface systems and regulatory queries. Min req. Bachelor's Degree in Economics/Comp. Sci. or equiv. and 1 yr. in job or job-related exp. including analyzing health data, Systems Development Life Cycle, and use of Oracle, Unix and Excel. Resumes to CCE Consulting, 369 Franklin Wright Blvd., Lake Orion, MI 48362.

Senior Software Engineer. Web development with server side scripting; desktop application development; database design; data transfer services, requirements analysis, and the definition of solution and architectures with two and three tier designs; project management; act as technical lead; and communicate with management in global corporate enterprises. Must have B.S. in Comp. Sci., Eng. or related, 3 yrs. exp., and knowledge of ASP, DHTML, VB Script, Javascript, VB, ADO, DAO, Win32API and COM technologies; MS Access, MS SOL Server 6.5, 7.0, and 2000; Erwin, DTS, CPM, MS Project, and MS Office. Send cover letter and resume to HRSoft, LLC, Attn: Paul Brook, 505 North 4th St., Fairfield, Iowa 52556

IT20 seeks qualified software engineers with experience in one or more of thefollowing technologies:

SAP, JAVA, ABAP, Vitria, Oracle, Windows & Unix. Salary commensurate with experience. Send cover letter and resume to IT20, 1755, Park Street, Suite #150, Naperville, IL- 60563 or jobs@it20.com

Amdocs, a leading developer of software solutions for the telecommunications industry is seeking team players with strong technical & personal skills for the following positions at our Chesterfield, MO location.:

★ Site Managers
--to manage telecommunications billing system at client site. Provide support in all application areas. Req'd.: Bach. Deg. in Comp. Sci, Math, Physics, Eng'g. or related discipline. Must have exp. w/ Oracle and VAX/VMS. Must have exp. w/telecommunications projects, and information systems projects management. Must have 2 yrs. exp. as Site Manager or Project Manager

★ Software Engineers
--to design, develop & implement software for communications networking products. Req'd.: Master's Degree in Comp. Sci. or Eng'g. and exp. w/Java, Oracle and SOL attained through educ. or employment. Must have 1 yr. exp. as Software Consultant/Analyst or Engineer.

--to conduct testing of telecommunications systems software and provide technical support and problem resolution. Req'd.: Master's Degree in Comp. Sci., Math, Eng'g or a related discipline and 2 yrs exp. as Software Engineer or other software development occupation. Must have exp.w/ C/C++, SOL, Oracle and telecomm projects.

--to generate supporting design documents, performance criteria and interoperability requirements for telecommunications systems. Req'd.: Master's Degree in Comp. Sci or Eng'g. and 2 yrs. exp. as Programmer/Analyst or Consultant. Must have exp. w/ SOL, HTML, Java, Visual Basic & telecomm. Projects.

★ Systems Analysts
--to analyze, design, code, test and integrate telecommunications billing system software. Req'd.: Bach. Deg. in Comp. Sci, Math, Physics, Eng'g., or a related discipline and 2 yrs. exp. as Systems Analyst or Programmer/Analyst. Must have exp. w/ COBOL, VSAM, DB2 and JCL.

--to conduct expensive testing on telecommunication software products according to customer requirements. Req'd.: Bach. Deg. in Comp. Sci, Math, Eng'g. or a related discipline and 2 yrs exp. as Systems Analyst or other software development occupation. Must have exp. w/ C/C++, SOL, Oracle and telecomm projects.

--to analyze new and existing telecomm software for mktg. mgmt. & inventory control. Req'd.: Bach. Deg. in Comp. Sci., Math, Physics, Eng'g., or a related discipline and 2 yrs. exp. as Systems Analyst or in other software development occupation. Must have exp. w/Visual Basic & SOL in a Windows NT environment and exp. w/telecomm projects.

--to design, develop, code & test software solutions for telecomm switch control & customer care. Req'd.: Bach. Deg. in Comp. Sci., Math, Physics, Eng'g or a related discipline & 6 months exp. as Systems Analyst or Programmer. Must have exp. w/ SQL & Powerbuilder acquired through employment or education and exp. w/ telecomm projects.

--to analyze new & existing telecomm software for billing systems. Req'd.: Bach. Deg. in Comp. Sci., Math, Eng'g. or other related discipline. Must have knowledge of C, C++ and UNIX attained through employment or education.

Due to the unpredictable growth of the telecommunications industry, candidates for all positions must be willing to temporarily relocate to client sites throughout the U.S.

Send resume to:
Amdocs, Inc.
1390 Timberlake Manor Parkway
Box STL23
Chesterfield, MO 63017
Fax. 314-212-7076
jobs@amdocs.com

Trainer, Professional Services

Pitney Bowes has an immediate opening in its Lisle, Illinois office for a Trainer, Professional Services.

Design, create, update and deliver courses for new and existing products, including a print stream manipulation product that enables the use of modern insertion equipment, the enhancement of printed output and the interface to print handling tools, as well as a suite of mailing efficiency and data quality solutions designed to maximize postal discounts and tools for dealing with customer tracking and returned mail 50-70% travel required.

Must possess at least a bachelor's or its equivalent in Computer Science or a related field and relevant experience as a Trainer in IT field, including hands on experience in the design, creation and delivery of technical and non-technical training content; and in the delivery of technical training in a variety of hardware environments, including mainframes and personal computers.

Resume and/or cover letter must reflect each requirement above and specify reference code TPS or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road, Stamford, CT 06926-0700.

Seeking qualified applicants for the following positions in Memphis, TN:
Sr Business Application Analyst: Coordinate/serve as liaison between technical developers and users/customers. Requirements: bachelor's degree* in computer science, math, statistics, business or related field plus 5 years of experience in analyzing business systems and developing technical automated solutions. Experience with PeopleSoft applications, SOR and Informix also required. Senior Programmer Analysts (2): Formulate/define functional requirements and documentation based on accepted user criteria. Requirements: bachelor's degree* in computer science, MIS, engineering or related field plus 5 years of experience in systems/applications development. Experience with Oracle and UNIX scripting also required. *A master's degree in the stated field can offset 2 years of required experience for any of the positions. Please indicate which position you are applying for on your resume. Submit resumes to Christin Decker, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V.

Senior Programmer Analyst

Pitney Bowes Inc. has an immediate opening in its Stamford, Connecticut office for a Senior Programmer Analyst.

Provide advanced software support and development for existing and new Worldwide Postage by Phone installations including system support, troubleshooting and system installations.

Must possess at least a bachelor's or its equivalent in Computer Science or Computer Engineering and relevant experience with Visual Basic 3.0 - 4.0, SOL Database Application programming using ODBC/RDO and Client/Server architecture and Microsoft SOL Server and Windows NT operating system.

Resume and/or cover loner must reflect each requirement above and specify reference code SPA or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road Stamford, CT 06926-0700.

An Atlanta-based computer consulting company is looking for qualified:

Programmer Analysts
Software Engineers
Database Administrators
Technical Support Speciliasts
Network and Systems Administrators

with extensive experience in at least 3 of the following:

HTML, Java, JavaScript, SOL, PL/SOL, Sybase, Oracle, Oracle Applications, Oralce DB, Sun Solaris, C, C++, Visual C++, Visual Basic, VB Script, People Soft, Cold Fusion, Perl , Korn Shell, Shell Scripting, AIX, Informix, HP-UX, TCP/IP

Redbrick Data Warehouse for its clients' projects throughout the U.S. Bachelor degree requried but master's preferred. 40 hrs/wk; 9 a.m. to 5 p.m.; M to F. Job locations varied. Send resume with salary requirements to: The Recruitment Manager, 292 S. Main St., Suite 500, Alpharetta, GA 30004

Senior Software Engineer

Pitney Bowes Inc. has an immediate opening in its Danbury, Connecticut office for a Senior Software Engineer.

Expand the features and capabilities of the Company's document messaging product's mission critical real-time control system utilizing OOAD and C++ software under WinNT. Code, design, debug and deploy components of this large C++ application.

Must possess at least a bachelor's or its equivalent in Computer Science, Engineering or a related field and relevant experience as a Software Developer. Must possess experience using OOAD and C++ under WinNT on large scale, multi-developer software projects.

Resume and/or cover letter must reflect each requirement above and specify reference code SSEVC or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road, Stamford, CT 06926-0700

Systems Analyst: Dev. Systems for tech. app.; Program in FoxPro, VB, Clipper, MS Access, MS SOL Server, Informix DB, System integration between PC & AS/400, Using Cobol, RPG/400, C/A, DB/2 knowledge of Windows 9X, NT, XP, 2000, Novell Netware, 5250 emul, experience in Drivers scheduling, manufacturing systems. Req. planning, evaluation, and develop user requests for new, modified existing programs using programming techniques & computer expertise, increasing operating efficiency or adapting to new req., oversee inst. of HW & SW, monitor programs performance SP, 5 yrs exp. in job offered. Fax 305-819-1510.

Software Engineeer. Must have Bachelor's in Computer Science/realted field or equiv. and 2 yrs exp. as Software Developer. Design, build and maintain company software systems for internal and external client use. Use knowledge of Structured Ouery Language, software system architectures, and project lifecycles to develop, document, and test codes. 40 hrs/wk, flexible shifts. Competitive salary. Send resume to: Private Business, Inc., ATTN: Human Resources, PO Box 1603, Brentwood, TN, 37024.

Senior/Staff Engineer

Pitney Bowes Inc.has an immediate opening in its Shelton, Connecticut office for a Senior/Staff Engineer.

Design and code Shipping Applications on AS/400 using PDM, SDJ and RPG.

Must possess at least a bachelor's or its equivalent in Computer Science, Engineering or a related field and relevant experience as a Software Engineer including programming in RPG and AS/400, CCL, PDM, SDJ and RPGIV.

Resume and/or cover letter must reflect each requirement above and specify reference code SSEKS or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road, Stamford, CT 06926-0700.

ERP Programmer - PeopleSoft Specialist - Will work in various unanticipated locations throughout the US with more time in Pennsylvania than anywhere else. Customize, implement and test PeopleSoft packages, including Financials, Distribution and Manufacturing and HR Management System. Use PeopleTools, PeopleCode, SOL, SOR, nVision, Crystal Reports, Import Manager, Cognos, Oracle database and BEA Tuxedo on Windows, Unix and Sun Enterprise Servers. Reqs: Bachelor's or foreign equivalent degree in Computer Science, Computer Engineering, Electrical Engineering, Electronic Engineering, Mechanical Engineering or Math and 3 months exp in the job offered. $66,828.70/yr, 40 hrs/wk, 8a-5p, M-F. Mail resume to JS Supervisor, Greene County Team PA Career Link, 4 West High Street, Waynesburg, PA 157370-1324, and refer to reference number WEB 239696. Application is by resume only.

Systems Adm. Mgr-Supv/mange Finacity's corp. BA or BS in Comp Sci or Comp Engnrg + 3 yrs exp in design,implement & manage complex info infrastructure technologies w/in financial svc mission critical back office environmnt. 1yr exp w/integrated RIM Blackberry Svc & w/HPD & 3 yr exp in the following: "Wintel" syst. admin; Windows NT/2000; ASP, JSP; CSP;Microsoft Content Mgt. Server;Microsoft OLAP; UNIX; ORACLE DB TCP/IP & DLC Pro~ tocol; performing cost/benefit analysis; design, implementatn of corp-wide backup/Disaster Recovery Plan;CISCO Pix Firewalls;Network Security w/Re~ more Access; Cisco Switches; CISCO ISO 12.x; Telecom Tarrif Mgt; VPN implementatn & Radius Svcs; IBM Midrange & Main Frame syst; & Compaq & Dell Servrs & Server Mgmt. Must be a Microsoft Certif Prof'l. Salary commens w/exp. Fax res:212-878-3526 or mail, M. Marwill, Financity Corp., 535 Madison Av, 7th fl, NY,NY 10022.

Sr. Software Engineer
Design and development of reports, functional specifications, and high level design utilizing BRIO. Must have BS in CS or EE or related & 3 yrs. exp. or 3yrs. exp. in a related position w/ability to use: Brio Administrator, Brio Ouery Designer, Brio SOR Report Builder, Brio One Integrator, DB2, J2EE, SOL Server, & Cold Fusion. 40.0 hrs./wk 8:00 AM - 5:00 PM $82,660/Yr.
Applicants send cover letter and resume to:

Ambrish R. Kochikar
Cyber Korp, Inc.
9667 B Main Street
Fairfax, VA 22031

A high-tech company is seeking the fllwing Software Engineers who will collaborate in the research, design & development of next-generation storage network systems. Req'd:
Software Engineer #1: Master's in CompSci. Min 1yr exp as Software Engineer/Researcher. Must have research and/or project exp w/Active Networks & network programming. REF#20065-1
Software Engineer #2: Master's in CompSci. Min 1yr exp as Software Engineer/Researcher. Must have research and/or project exp w/design & development of IP protocol stacks. REF#20065-2 Software Engineer #3: Master's in CompSci. Min 1 yr exp as Software Engineer/Researcher. Must have research and/or project exp w/network security & access control in IS. REF#20065-3
Send res. to: Anne Budowsky, Nextorage, Inc., 520 8th Ave., 21st Fl., NY, NY 10018. PLS INDICATE REF#.

Axiom Systems, Inc., an enterprise technology company currently seeks applicants for the following positions in its Alpharetta, GA location: Senior Programmer Analyst - analyze requirements, design, develop and test product lifecycle management and workflow customizations of web-based applications; PDM Integration Analyst - design, develop and test seamless integration of PDM and CAD systems;. PDM Programmer Analyst - analyze requirements, design, develop and test prodcut lifecycle management and worfklow scenarios; Programmer Analyst - analyze requirements, design, develop and test Internet-based software systems and applications. Applicants for these positions must have a bachelor's or master's degree in Computer Science, Engineering or related field plus 2-5 years of relevant experience. For consideration, please forward your resume along with letter specifying position applying for, to: Axiom Systems, Inc., Attention, Chuck Stickels, 2550 Northwinds Parkway, Suite 440, Alpharetta, GA 30004. EOE

Programmer Analyst - Will work in various unanticipated locations throughout the US with more time in Pennsylvania than anywhere else. Design, develop and implement MS Windows based ERP Applications. Use SAP, ABAP/4, Oracle, BAPI's, BDC's, Reports, SAP Scripts, SOL and CRM Packages on Unix, IBM PC, and RS 6000 Servers. Also develop Unix based interface applications using GENTRAN mapping tool. Reqs: Bachelor's or foreign equivalent degree in Computer Science, Computer Engineering, Electrical Engineering, Electronic Engineering, Mechanical Engineering or Math and 1 year exp in the job offered. $66,828.70/yr, 40 hrs/wk, 8a-5p, M-F. Mail resume to JS Supervisor, Greene County Team PA CareerLink, 4 West High Street, Waynesburg, PA 157370-1324, and refer to reference number WEB 242772. Application is by resume only.

Titan Systems Corp. needs a Principal Computer Scientist in Jacksonville, FL to develop software, install & configure using: Oracle RDBMS, Oracle Developer Forms, Reports, and Developer Server, Oracle Designer, Oracle iAS (Oracle Portal, iFS, Report Services), Microsoft SOL Server, Microsoft ACCESS, Sybase Power Builder, SQL, PLSQL, VBA.Windows 2000, NT, 98. Bach Deg Comp Sci or rel field + 2 yrs exp in job specified or 2 yrs software dev exp w/ EDMS, RAMP & MAPS. Resumes to D. Dickinson, Titan Systems Corp. 815 East Gate Dr. Mount Laurel, NJ 08054.

Software Engineer req'd by an Enterprise Data/Application Integration co. in Edison, NJ. Must have Bachelor's Degree in Computer Science or Engineering or Equivalent & two yrs of exp. in designing, developing, testing & integrating enterprise application packages using C++, Visual Basic, VB Script, Visual Interdev, HTML, DHTML, XML, MSHTML, MTS, IIS,ActiveX, COM,DCOM, ODBC in n-tier environment under Windows/NT environment; performing data migration & schema design; creating relational databases such as Oracle, DB2 & SQL Server. Please respond repond to HR Dept., Mindware Inc., 12 Charles Court, Edison, NJ 08820.

Consulting comp. in Edison, NJ req. Prog. Analyst w/BS deg. & 2 yrs. exp. or Software Engg. w/MS & 1 yr. exp. or its equivalent in both prof. Equivl. is based on educ. & exp. evaluation.
Skill: Active X, Visual Speller, Visual Studio, Visual Cafe, Visual Basic, VC++, Front end Screens & Reports, Crystal Reports, COM, D COM, XML, RMI, UML, Java Servlets, Weblogic, Middleware logic, C, C++, SQL Plus, Oracle.
Travel & reloc. req. to unanticipated client sites anywhere in the U.S. as assigned. Send copy of ad w/resumes to: Caresoft, Inc., Attn: Recruiter, 3602 Hana Road, Edison, NJ 08817 or E-mail to: recruiter@caresoftinc.com

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Software Co in Metuchen, NJ seeks to fill multiple job openings for:
Software Engnrs/Progrmmr Anlysts/Systms Anlysts/ Mngmnt Systms Anlysts - with the following skill sets:
1. Java, Java Scripts, Oracle & HTML.
2. SAP R/3, ABAP/4, Oracle & Developer 2000.
3. Java, Java Scripts & Java Sevlets.
All positions require a Bachelors or equiv (Software Engnrs require Master's or equiv) in Math, Sci, Comp Sci, Enggnrng or related; and, a min of one to two years of exp in the skill sets listed above. Any combination of edu, training & exp that equates to the minimum requirements will be accepted. Apply to Innospire Systems Corp, 267 Amboy Avenue, # 14 A, Metuchen, NJ 08840. Fax: 208.728.5619. E-Mail personnel@innospire.com

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Programmer Analyst, Multiple openings, wanted by IT Firm in Deleware.
Programmer Analyst, Must have BS in Engineering plus 2 yrs of telecom software development in C/C++/Java using VoIP (H.323/SIP/MGCP/MEGACO/RTSP), GSM/GPRS/CDPD, SS7(ISUP/MTP/SCCP/TCAP/INAP) and/or LAN/WAN(TCP/IP,UDP/SNMP/X.25/ATM) protocols.

Programmer Analyst, Must have Bach. in Sci. or Engineering or MIS plus 2 years experience in dsgng & devlpg net enabled applics using SOL, PL/SQL, C, C++, ASP, Java, HTML, DHTML for c/s Windows 95/98/NT, Unix, MS DOS; etc.

Respond to HR Dept, Neotech Solutions Inc, 1170 Broadway, Suite 314, New York, NY 10001

Call your
ITcareers Sales
Representative
or Janis Crowley.
1-800-762-2977

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Q DATA USA, INC.

We are a leading company in providing ERP consulting, Networking, e-Business solutions and application development to Fortune 500 corporations. We have multiple openings for performance driven IT professionals and Project Managers with the following skills: IBM M/F, MVS/ESA, OS390, Windows, Windows NT, SUN, HP Unix, DB2, VSAM, ADABAS, BTRIEVE, ORACLE, CICS, COBOL, NATURAL, JCL, VB, HTML, JAVA Script, JES 2, MAGIC, ROSCOE, IMS, C/C++, SAP, and TCP/IP. Send resume to l_deharak@qdatausa.com

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COMPUTER/IT
Openings available for the following positions:
Business Applications Specialist - Exp. with interface development and Enterprise Interface Manager (EIM) data transfer mechanism for Siebel technology. Must also have exp. with structured design, development, and implementation of new computing architectures.
SAP Basis Administrator/Support Specialist - Exp. with SAP Basis administration. Must also have exp. with Oracle database administration and UNIX.
Information Security Specialist - Exp. with SAP security administration. Must also have exp. with SAP security profile creation and administration.
Enterprise Project Manager – Manager Data Portals - Exp. in integration of application systems and system development. Must also have exp. with MOSeries, Windows NT, HP-UX, Connect: Direct, Mercator, integrating SAP in a heterogeneous environment, and leading a team through a systems development lifecycle.
MAIL resume to Mary Lou Simo, Nestlé USA, Inc., 800 N. Brand Blvd., Glendale, CA 91203. NO PHONE CALLS OR THIRD-PARTY AGENTS PLEASE.

Software Engineer. Sought by Englewood Colorado consulting company. To work in various unanticipated locations throughout the United States. Research, design and develop computer software systems in conjunction with hardware product development. Analyze software requirements to determine feasibility of design within time and cost restraints. Consult with clients to define needs or problems. Use of Oracle, SOLBase, COBOL, Developer 2000, Pro*C, Sybase, Power Builder and Windows NT. Reqs. Master's in Computer Applications, Computer Science, Computer Engineering or related field. Plus 2 years in the job offered or 2 years in a related occupation such as a Programmer Analyst, Systems Executive or Software Executive. $75,000/year, 40/hrs/wk, 8AM-5PM. Respond by resume to Colorado Department of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe St., Denver, CO 80202 and refer to Job Order No. CO 5017871

Programmer/Analyst, Database & Web Applications: Under direction of MIS manager, plan, develop, test, & document computer database & web based programs relating to third party employee benefits services. 40 hour work week; 8 am to 4 pm, Competitive Salary Offered. Requires Bachelor degree in Comp. Sci., Math or Statistics and 1 year experience in job offered or in related job of Computer Consultant or Analyst. Experience to include use of Lotus Notes/Domino, Lotus Script & Java Script. Must have proof of legal authority to work permanently in the U.S. interested applicants should send resume and cover letter referencing Job #145 to: Nancy Tinsley, BSSI, 760 Pasquinelli Dr., Suite 320, Westmont, IL 60559-5555. NO CALLS.

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A position is available for a Systems Programmer Team Leader with an Atlanta-based business services and information products company. The company provides a wide range of integrated business management services, software solutions, and extensive connectivity to more than 18,000 physicians and 2,000 healthcare organizations across the nation.
The Team Leader will be primarily responsible for developing, modifying, and debugging computer code in Visual Basic (VB) 6.0 using COM, COM+, and SOL.
Candidates for this position should possess a Bachelor's degree in Computer Science or a related field and at least two years' experience in software development including Visual Basic, SOL Server, and demonstrated knowledge of EDI coding.

Apply by mail to:
Terry Bozeman
2840 Wilkinson Parkway
Atlanta, Georgia 30339

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DIVERSITY IN IT CAREERS

Advertising Supplement

Reaching out in IT

By Jennifer Hicks

IMDIVERSITY.com

Consider the following scenario, provided by the U.S. Department of Labor:

- By 2008, the number of jobs requiring a technical degree will grow by 51 percent and more than two million current IT workers will retire.
- The number of women in the labor force will grow more rapidly than will the number of men
- By 2010, the labor pools of Asian-, Hispanic-, and African-Americans workers will increase respectively by 44, 36, and 21 percent.
- The white labor force will decrease from 73 percent in 2000 to 69 percent in 2010.

How's that for opportunity knocking? But, before we rejoice, look at these dismal statistics:

- African Americans comprise 12.3 percent of the American population, but only 5.4 percent of computer programmers and 7.1 percent of computer systems analysts, according to the Information Technology Association of America.
- Hispanic Americans comprise 12.5 percent of the population, but hold 4.6 and 2.5 percent of the programming and systems analysts jobs, respectively.
- American Indian and Alaskan Natives, at 1.5 percent of the population, account for only 0.2 percent of the total IT workforce.
- Women, about one-half the labor force, have seen diminishing representation in IT - 40.2 percent in 1996 to 28.9 percent in 1999.

Clearly there is a disconnect, but many organizations try to remedy the disparity and create work environments conducive to diverse workforces. To do so, they use awareness training, brown bag lunches, "diversity teams," targeted recruiting, and in-house leadership programs.

Los Alamos National Laboratory (LANL), in Los Alamos, NM is one such successful example. Currently, the composition of their IT employees is:

- 2% American Indian
- 3% Asian/Pacific Islander
- 0.5% African-American
- 29% Hispanic
- 62% White

According to Lisa Gutierrez, Director of Diversity, LANL focuses on awareness training, hiring practices, Web site development, and diversity consulting to assist their employees in working within a diverse environment.

In addition, LANL has "chosen an approach of weaving diversity into the core strategies of the Laboratory," says Gutierrez.

LANL has capitalized on it proximity to American Indian reservations. According to Barbara Grimes, of LANL's American Indian Education & Employment Outreach Community Relations Office, more than 140 tribal students participated in science workshops or career panel presentations through visits to the Laboratory or activities in their schools or communities. Last summer alone, 35 American Indian students participated in the LANL's student employment programs

It is this reaching out to students and showing them opportunities in IT, that is essential if organizations are truly committed to a full-employment world-class IT workforce. As Dr. Shirley Ann Jackson, president of Rensselaer Polytechnic Institute noted: "As with any shortage, we must look to untapped resources to fill this gap. Those resources readily are available among young women and minority youth. Both groups are vastly under-represented in the sciences, engineering, and technology. The shortage of technological workers could be eliminated entirely if women and minorities were represented in these fields in parity with their percentages in the total workforce population."

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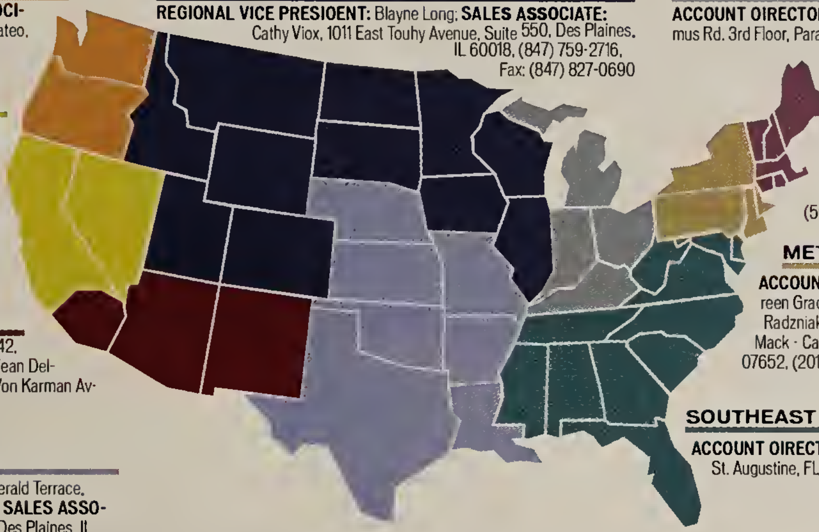

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Hotelier Uses Web Services To Centralize IT Management

Homegrown apps to speed upgrades

BY JENNIFER DISABATINO

CHOICE HOTELS International Inc. is doing Web services its own way. The company, which owns the Comfort Inn, Quality Inn and Econo Lodge chains, is updating the property management software it developed in-house five years ago. The new Web-enabled version of the system, also developed internally, allows software upgrades to be managed centrally and distributed with greater speed and frequency.

"Really, it's going to make distributing the [management applications and upgrades] so much easier. Rollout will be a snap compared to rolling out an executable [file] to a hotel," said Chad Mason, manager of software quality assurance at the Silver Spring, Md.-based company. Choice will now push out upgrades once or twice each month instead of once a year, he added.

Hotel property managers will be able to check occupancy rates, supply inventories and maintenance information through a Web browser. The new software will also standardize the versions of systems used on a corporate level and by the individual hotel chains.

Project Essentials

Choice's Web services initiative involves connecting the Web-based applications internally before linking them to outside vendors. Being able to make changes and test systems securely behind the firewall is essential, Mason said.

"Whether you pay somebody else or you do it yourself, there has to be very tight control over what you do in [your] environment," he said.

The software is being developed with tools from Rational Software Corp. in Cupertino, Calif. Rational products such as Rational Rose are the "backbone" of software development at Choice, Mason said. He added that the firm's decision to develop its own software stemmed from a lack of suitable off-the-shelf applications, as well as from the fact that Choice had been burned by a vendor he wouldn't name that delivered software late and failed to meet project specifications.

"I don't know if that left a bad taste in the mouth of the company. We ran up against a lot of walls around the way it was architected, where we weren't able to do exactly what we wanted," Mason said. "We have a staff that's been with the company for quite a while, and they really understand what our licensees need from the company. It would probably take longer to go out and find what we need." By designing the software internally, "we guarantee we get what we want," he said.

Mike Gilpin, an analyst at Giga Information Group Inc. in Cambridge, Mass., said the Choice project is typical of development efforts being considered throughout the travel industry that would enable disparate operations to have common access to inventory data and other information.

Choice already has an online procurement site, called ChoiceBuys.com, where licensees can order goods and services electronically from vendors with whom Choice has negotiated special deals. Mason was unable to say whether the management system and the procurement system will be integrated, and officials at the ChoiceBuys.com unit weren't available for comment. ◗

Continued from page 1

Road Map

500 rack-mounted and Unix-based Compaq AlphaServers to run its image-rendering applications.

"I've seen Alpha road maps going forward for at least the next several years," indicating that the systems will continue to be supported, Ludwig said.

Fiorina said three levels of executive management have been put in place across the merged organization. New account management teams are already in place for HP's top 100 or so customers, she added, and the entire sales force has been given new guidelines on how to operate.

"I think they are clearly being very proactive and seem to be executing crisply," said David Krauthamer, corporate director of IT at Advanced Fibre Communications Inc., a Petaluma, Calif.-based HP user that manufactures telecommunications equipment.

In general, there were no unpleasant surprises for users on the product front. High-end users of Compaq's Himalaya fault-tolerant systems, AlphaServers and OpenVMS operating system will continue to see development and receive support. There will be at least two more generations of Alpha-based systems, and HP said it plans to continue selling AlphaServers through 2006.

HP said it will standardize on its own HP-UX version of Unix but integrate key technologies such as clustering and file systems from Compaq's Tru64 Unix over the next three years. In addition, Tru64 will still be offered on AlphaServers.

All high-end hardware will eventually be migrated over to Intel Corp.'s 64-bit Itanium processors. But HP will leave it up to users to choose when they want to migrate.

As expected, HP said it has picked Compaq's ProLiant systems to be its 32-bit Intel servers, as well as Compaq's iPaq brand of handheld devices. It will also sell PCs under the Compaq brand.

"They seem to have made a lot of good technology choices," said Dan Mahoney, an analyst at Cambridge, Mass.-based Giga Information Group Inc.

But not everyone was convinced that HP's promise of continued support for products will guarantee the continued success of those lines.

"We're concerned. Compaq was our preferred vendor, and we knew we could rely and count on them to provide really solid [Intel] hardware," said Matt Kesner, chief technology officer at law firm Fenwick & West LLP in San Francisco.

With HP, things are less certain, Kesner said. "We think they have the best intentions, and we are sure they believe what they are saying, but no one knows for sure what Compaq servers or HP will look like a year from now," he said. ◗

The New HP Product Road Map

BEFORE THE MERGER	AFTER THE MERGER
32-BIT INTEL SERVERS **Compaq ProLiant, HP Netserver**	ProLiant servers will be renamed HP ProLiant and become HP's offering.
64-BIT INTEL SERVERS (ITANIUM) **Both HP and Compaq are shipping early versions, mainly to developers**	Development will follow HP's road map, but the servers will integrate features from Compaq's 64-bit ProLiant family.
RISC-BASED SERVERS **Compaq Alpha, HP PA-RISC**	Development will continue on both technologies, per previously published road maps, with HP's PA 8800 and 8900 processors and Compaq's EV7 and EV79 Alpha processors all still part of the plan. Eventually, the lines will be converged into a common 64-bit Intel architecture.
UNIX **HP-UX, Compaq's Tru64 Unix**	HP will standardize around HP-UX. Features from Tru64, such as clustering and file systems, will be integrated into HP-UX over the next three years.
FAULT-TOLERANT SERVERS **Compaq's Himalaya NonStop Server**	Development will continue as scheduled under the name HP NonStop Server.

SOURCE: HEWLETT-PACKARD

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FRANK HAYES/FRANKLY SPEAKING

Assault on Privacy

THE RULES OF the privacy game have changed again, and you probably didn't even notice. It happened early this month, when a federal judge ruled that a company must begin collecting information electronically on its customers' behavior. Not that it *can* — but that it *must.* Worse still, it's information the company doesn't want to collect, for fear of angering customers.

Why didn't you hear about this? Because it wasn't some dot-com gathering customer information from a Web site. It was SonicBlue Inc., which makes the ReplayTV line of digital video recorders.

But the implications for corporate IT shops are just as nasty.

Here's what happened: SonicBlue is being sued by several movie studios and television networks, which claim that two of ReplayTV's features — the ability to skip over commercials and the ability to send programming to other ReplayTV owners across the Internet — contribute to copyright infringement.

As part of the pretrial discovery process, the studios and networks demanded that SonicBlue turn over data on exactly how customers use ReplayTV. SonicBlue said it doesn't collect that information. The judge then ordered SonicBlue to write software that will monitor every show its customers watch, every commercial they skip and any programming they send across the Internet — and turn the data over to the entertainment companies.

Wait, it's messier than it sounds. The entertainment companies say SonicBlue's published privacy policy warns users that SonicBlue may collect audience data. SonicBlue says that version of its privacy policy is outdated — the company originally considered collecting that data but dumped the idea after one of its competitors, Tivo Inc., floated the same idea and got howls of anger from customers and privacy advocates.

But even though SonicBlue abandoned the data collection idea — and even though collecting the data violates the company's actual confidentiality policy — the company will now have to fight in court to avoid having to closely track exactly what each individual customer does with his ReplayTV and then share the data with a third party.

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at **frank_hayes@computerworld.com.**

In other words, exactly the kind of privacy invasion that customers hate.

You can see where this is going, can't you?

For years, we've been getting more and more careful about the privacy of customers who visit our Web sites. We stopped collecting data we didn't need. We took better care of the data we did collect. Lots of us told customers we would not sell or give information about them to third parties. We published privacy policies that promised customers they could trust us.

That trust took a serious hit when bankruptcy judges decided that, promises and privacy policies be damned, customer information was an asset that could be sold to a third party if a company went belly-up. But, mostly, we've been able to keep those promises and live up to our customers' hard-won trust.

And now that we've finally learned our privacy lesson, along comes a judge who believes customers' privacy is worth so little that on a questionable legal theory (zapping commercials is copyright infringement?), he orders a wholesale fishing expedition to gather huge amounts of data about thousands of customers — without their consent, automatically, across the Internet.

And we already know just how customers feel about being treated that way.

SonicBlue says it will appeal. Let's hope the judge's order is thrown out — quickly and decisively.

Because if one judge can do it to SonicBlue's customers, another judge can do it to yours the next time your company is sued.

And if that happens, no matter how hard you've worked to build privacy and confidentiality into your Internet systems, your customers' trust that you'll protect their privacy will be blown right out of the water. ▶

SHARK TANK

TIGHT OFFICE space at headquarters squeezes some IT staffers out to a nearby modular building, says pilot fish. And at a meeting, one manager takes note of how well it's working out. The employees in the makeshift offices seem to have a great attitude and even have fun at work, the manager says. Then he adds, apparently without thinking, "Maybe they have more fun just because there are no managers in the modular building."

PILOT FISH cringes at the enthusiasm-gone-wrong that's evident in a status report on this IT project: "I now have a complete estimate for the customer, including full commitment and dates from each of the teams involved to implement the work. This is quite remarkable, as I haven't even completed the proposal or project plan!"

WIRELESS INTERNET start-up gets its biggest client ever, and IT manager pilot fish is sent off to make sure client's CEO is connected and happy. Fish gets grandmotherly CEO set up, then offers to demonstrate how she can track her stock portfolio. "Only I misspelled *Nasdaq.com* and was treated to a big, flashing porn image," says horrified fish. "Don't worry, hon," laughs CEO. "I see those in the mirror every morning."

POTENTIAL client asks this consultant pilot fish to work up a security project proposal as a "philosophical overview." Fish does – and client rejects it, saying, "What we really need is a cookbook our people can work from." So fish writes that – and client rejects it, saying, "What we really need is a document that provides both the philosophical overview *and* the cookbook." Fish produces *that* – and client rejects it. The reason this time: "Your document lacks focus!"

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The 5th Wave

Before installing Windows XP, Dwayne prepares to partition the hard drive.

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